November 25, 1935

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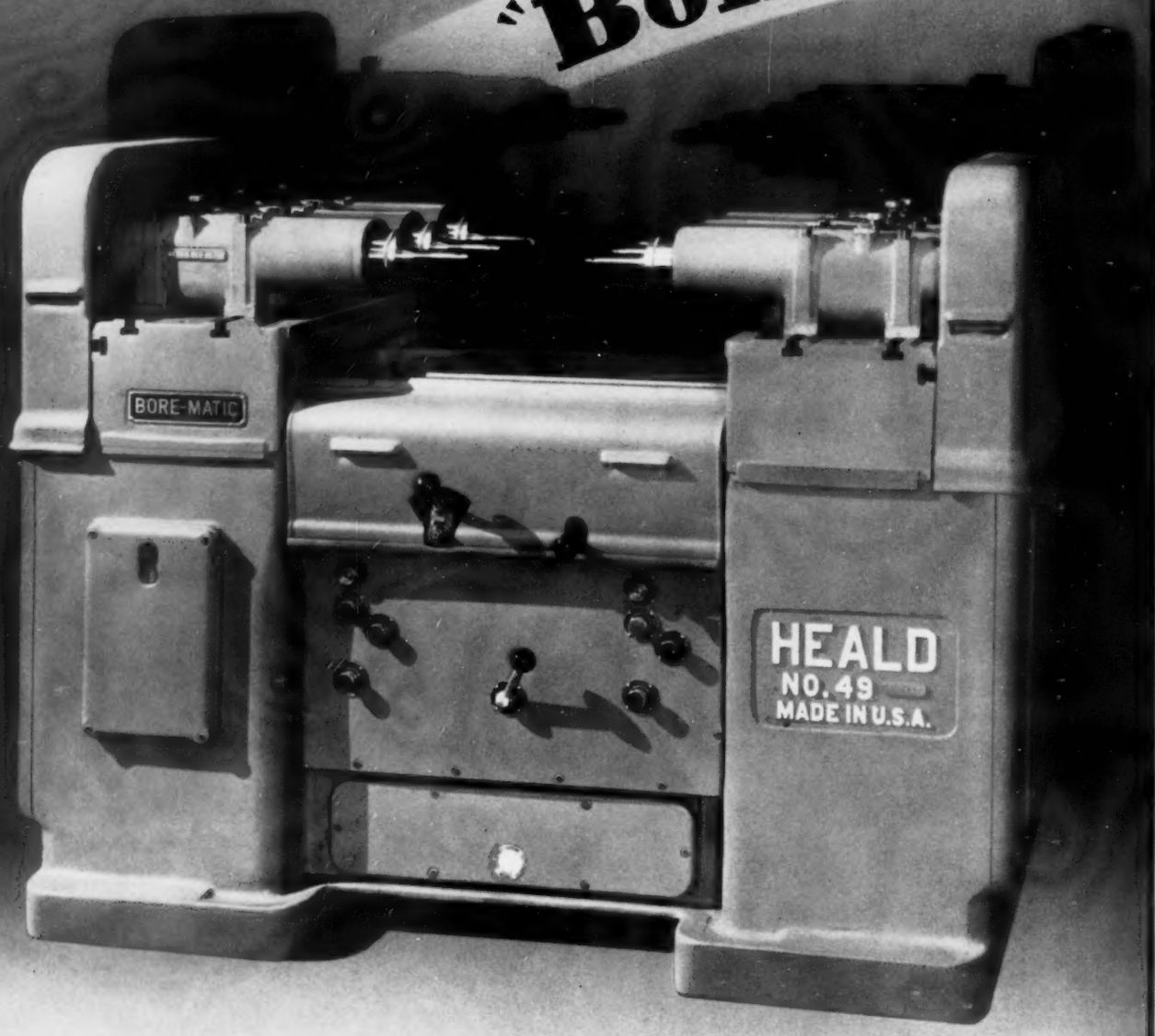

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As the Editor Views the News

OPINIONS based upon the traditional arguments on protection versus free trade mean little when applied to the new reciprocal trade pact between the United States and Canada. Actual results, as observed after the agreement has been in effect for a reasonable time, will determine its real value. On broad lines, the revised duties seem to favor Canada's consumers and the States' industries and to affect adversely the former's industries and the latter's farmers. Superficially the new schedules on steel products, equipment and machinery entering the Dominion (p. 18) would appear to confer marked benefits upon the heavy industries of the United States.

• • •

Don't Prejudge New Tariff

However, it should be realized that the mere reduction of duties by about 8 to 15 per cent on certain steel products and roughly 12 to 30 per cent on equipment and machinery in itself is only one of many factors to be considered. On products for which the Canadian buying habits, taste or temperament lean toward the American article, the reduction probably will enhance sales in the Dominion. On others, where the northern neighbors are bound by sentiment, tradition or real preference to British goods, the lowered duties will exert little influence. In any event, England may be counted upon to protect its present advantage vigorously.

• • •

Price Control and Earnings

In view of the persistence with which certain members of the President's cabinet hurl barbed darts at the steel industry for its alleged collusion or control on prices, a statement incorporated in Tom M. Girdler's address to the National Founders' association (p. 15) is timely, appropriate and challenging. Referring to this charge of "undue price maintenance," Mr. Girdler said "If the charge were true, it would be reflected in earnings." He then showed that the earnings of leading producers on capitalization from 1928 to Oct. 1, 1935, after all charges but before dividends has been only 1.6 per cent. "If there has been any maintenance of prices in the steel industry," he concluded, "it has been maintenance of prices at too low a level!" It is too bad that price history in terms of quality has not been compiled. It would show that many prices today really are lower than they appear to be.

• • •

Will Money Talk in 1936?

In balancing the strong tone of the current industrial outlook (p. 63), coupled with the more favorable showing of earnings in the third quarter, against the record-breaking accumulation of excess bank reserves (p. 28), one cannot escape the conviction that sooner or later the common bond of interest between industry and finance will find a way to utilize part of that idle capital profitably. When investment money again flows more freely into private projects, the long-starved durable goods industries will be among the first to benefit. More constructive action at Washington could easily release a portion of the pent-up funds. The tide is turning toward more consideration for the rights of investors. If congress senses this change, capital may yet be a big factor in 1936 business.

• • •

Depleting Our Mineral Stores

Is this country depleting its mineral wealth too rapidly? One authority (p. 39) declares that measured reserves of present commercial grades of oil, zinc and lead are sufficient for from 15 to 20 years; of high-grade Mesabi iron ores for 40 years; and of coal favorably located a century or two. His warning that the problem of conservation "is now squarely before us," is worthy of more attention than is being given the subject by industries most directly concerned . . . . In recent years metal finishing has assumed prime importance due to the fact that manufactured articles in popular demand require more exacting surface treatment. The need for more attractive and durable finishes (p. 30), which involves marked changes in production methods, presents a challenge to many manufacturers.

E. L. Shaner

American Piling Wins Over German; Ickes Fighting Mills

AMERICAN steelmakers won a double victory last week in the controversy over the use of foreign steel in public works projects financed in whole or in part by the federal government as part of its unemployment-relief program.

The differential for domestic steel over foreign was increased from 15 per cent to 25, while the contract for German sheet piling for the Queens approach to the Triborough bridge in New York was cancelled and an order for 350 to 500 tons of piling was placed with the Jones & Laughlin Steel Corp., Pittsburgh.

When substitution of American steel for German on the Triborough bridge was announced the Kloeckner Steel Co., New York, which had the contract to supply the Nazi product, issued a charge that the use of American piling would require a revision of cofferdams and additional bracing. This charge elicited the following statement from Jones & Laughlin officials:

"The use of Jones & Laughlin steel piling on the Triborough bridge job will not mean a change in type of construction and will not call for any more bracing than the German type or any other type steel piling, as additional bracing is common practice in cofferdam work to obtain effective watertight construction and for greater safety to workmen.

"The contract for Jones & Laughlin steel piling was given at the regular market price of $50 a ton, as originally bid, with no price reductions, commissions or other concessions."

Bar French Cement

Meanwhile, city officials of New York, sensitive to the outcry against diversion of relief funds to foreign manufacturers, announced that they would not permit the use of French cement in the construction of school buildings in New York.

And in Washington, PWA Director Ickes, for whom the change of the price differential and the assumption of responsibility for directing the placement of PWA materials (STEEL, Nov. 18, p. 14) involved considerable backtracking, was forwarding to the President data on the four identical bids received on steel for the Triborough project and also the ocean terminal at Morehead City, N. C. Incidentally, the Morehead City project, requiring 1500 tons of piling, has proceeded too far for rescinding the contract for German steel.

The four producers whose identical bids aroused Mr. Ickes are the Carnegie Steel Co., Jones & Laughlin Steel Corp., Inland Steel Co., and the Kalman Steel Co., a subsidiary of the Bethlehem Steel Co.

Apparently relaying his charges of collusion to the federal trade commission via the White House in order to achieve a maximum of publicity, Mr. Ickes said last week:

"I can't believe costs are the same for steel manufacturers, and certainly freight rates were different since the bids were f.o.b. New York."

Commission To Push Inquiry

In receiving the Ickes protest from the White House Friday the trade commission said:

"The commission has been requested by the President to make an examination into the fairness and reasonableness of certain bids submitted in connection with government purchase of steel for public works projects, and to report to him with recommendations.

"In his letter requesting the inquiry the President advised that certain facts had come to his attention in connection with the purchase of steel for public works projects which the commission should investigate to determine whether American steel manufacturers are bidding collusively and unfairly, and whether foreign steel manufacturers are dumping such products in the United States.

"Together with his letter the President transmitted copies of bids and other documents received in connection with certain public works. The commission will undertake the inquiry immediately."

Could sound effects be conveyed by the written word something akin to a smacking of the lips would have accompanied the final sentence of the trade commission's statement.

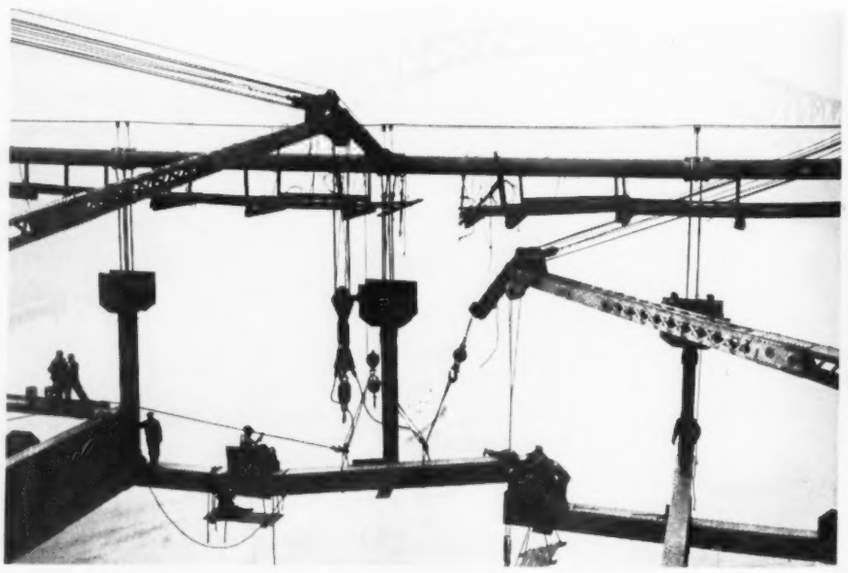
Sentiment Against Administration

This attack by Mr. Ickes, apparently arising from a lack of understanding of the steel basing point system, was the only sour note in the entire controversy so far as the iron and steel industry is concerned.

Barring a few Democratic newspapers, public sentiment appeared to be practically unanimous in denouncing the Roosevelt administration for permitting foreign steel to be purchased with funds appropriated for alleviating unemployment. There appeared to be complete sympathy with the inability of the steel industry, paying common labor 44 cents an hour, to compete with European steel labor averaging only 29 cents.

In some quarters in Washington it was felt last week that while the increased 25 per cent differential on foreign steel for use in PWA projects was insufficient to bar the im-

The Bridge That Put the New Deal on the Defensive



While the international storm was raging over the use of German sheet piling for approaches to the Triborough bridge in New York, the last girder—made from American steel—joining the span over the East river connecting the borough of Manhattan with the borough of Queens was swinging into place. The bridge will eventually connect the Bronx with these two boroughs. Wide World photo

portation of some subsidized products, nevertheless the adverse publicity of the past ten days would preclude further foreign purchases.

Report League for Sanctions on Steel

INFORMATION now in the hands of the state department in Washington indicates that the League of Nations has adopted the suggestion of Canada that iron and steel be included in the embargo against Italy.

However, while these sanctions have been voted they have not yet been applied, and no date has been set for their application.

Canada suggested that the following be included in the sanctions for embargo by the League members" * * * pig iron, iron and steel including alloy steels, cast, forged, rolled, drawn, stamped or pressed."

These commodities were approved by the economic subcommittee of the League and were later approved by the committee of 18 which has the last say.

Among the commodities now included in the embargo, which is effective, are iron ore and scrap iron, manganese ore, vanadium, ferromolybdenum, ferrosilicon, and silicomanganese.

Exports of iron and steel products from the United States to Italy in October totaled 44,746 tons, compared with 40,475 tons in September and 18,585 tons last October. October exports included 44,301 tons of scrap, 45 tons of black sheets, and 400 tons of car wheels and axles.

Founders Herald Natural Recovery; Pangborn Retained

THROUGH the thirty-ninth annual convention of the National Founders association in New York, Wednesday and Thursday, ran a strain of solid conviction that recovery is under way but that it is the irrepressible upward thrust of natural forces rather than a direct result of new deal policies.

And it was emphasized by speaker after speaker that industry must become vocal, it must aggressively combat demoralization of labor and finance which hostile forces at Washington are sponsoring. Considered in its broad aspects, this convention was a confident, fighting one.

Thomas W. Pangborn, president, Pangborn Corp., Hagerstown, Md., was elected president for the third consecutive term. Franklin R. Hoadley, vice president, Farrel-Birmingham Co., Ansonia, Conn., was named vice president; J. M. Taylor, Chicago, was re-elected secretary-treasurer, and A. E. McClintock, Chicago, was re-elected commissioner.

New district officers elected were E. H. Pierce, Atwood Machine Co., Stonington, Conn., first district; Noah F. Young, Lumen Bearing Co., Buffalo, second district; C. H. Hofstetter, Odin Stove Mfg. Co., Erie, Pa., third district; J. S. Tatman, Roots-Connersville Blower Co., Connersville, Ind., and W. L. Seelbach, Forest City Foundries Co., Cleveland, fourth district; J. C. Sanders, American Foundry & Mfg. Co., St. Louis, fifth district; Frederic Crosby, American Hoist & Derrick Co., St. Paul, sixth district; Houston Dudley, Gray & Dudley Co., Nashville, Tenn., seventh district.

S. Wells Utley, president, Detroit Steel Castings Co., Detroit, was elected a member of the administration council.

With a trenchant brush Tom M. Girdler, chairman and president, Republic Steel Corp., Cleveland, painted a picture of present-day conditions in the iron and steel industry.

In more than 10 years the rate of return on invested capital in the steel industry has been only 1.6 per cent, including the first nine months of 1935, or less than an ordinary savings account, he maintained. On the other hand, the automobile industry, "a fine example of inventive genius, efficiency and mass production," has averaged over 11 per cent in the same period and part of this showing has been due to the progress in steelmaking and at the expense of profits in steel, Mr. Girdler charged.

Livelihood for 2,000,000

He said further:

"Employment in the steel industry has now reached its normal level of about 420,000. If you take into consideration the dependents of these employes, and also the men engaged in mining and transporting ore, coal and limestone, it means the steel industry, directly and indirectly, is responsible for the livelihood, and therefore, for the spending power, of at least 2,000,000 people.

"The standard of living which supports our modern system of mass production necessitates reasonable wage levels. These wage levels in turn make necessary certain price levels. At the time when wages in the steel industry were being maintained in the face of depression markets, the one-half million stockholders in the industry were receiving nothing but reports in red ink.

"The steel industry is now definitely emerging from the depression. It is emerging through the only route possible under our present system of business—research, invention, and improved efficiency of operation, which are making possible a better quality of product with constant efforts to make such product available to a larger number of users at a fair price. But in considering what is a fair price, the steel industry insists that the stockholders as well as wage-earners are, after five

A Pre-View of a 1936 Russian Model

Heretofore the Soviets have built only open Ford cars but now, like Ford itself, they are entering the medium-price field. Above is shown a wood model of a sedan which the Zis plant in Moscow will manufacture. Dies for it are being made in the plant of the Edward G. Budd Mfg. Co., Philadelphia, where the above photo was taken. Left to right are V. N. Lialin, chief engineer of Zis; Walter Graf, a Budd engineer; and I. I. Wittenberg, production manager of Zis

lean years, entitled to some consideration."

Walter E. Spahr, department of economics, school of commerce, New York university, warned against putting too much dependence on Washington for assistance in the upturn of business. Such improvement already registered has been in spite of governmental policies rather than because of them. He said:

A Political Expedient

"I believe business men will be cultivated or encouraged only when it seems politically expedient to do so. It is expedient now because an election is approaching. But business men should remember how they have been invited to conferences in the past, how they have been asked to co-operate with and support the government, and how the administration has turned around, almost before the conferees could reach home and has soaked them with some severe restrictive measures. It would be well to remember how this administration abused the United States chamber of commerce when it put in its plea for the business man. Now business men are being cultivated again."

Discussing the labor situation, Mr. McClintock outlined various factors that have contributed to increased strike disorders. Principal among these, he indicated, was the knowledge among workers that they could always rely on federal relief in the event things did not go to suit them. This government relief, he pointed out, has gone far toward lifting from trade union leaders responsibilities that in the past have resulted in more conservative policies. Mr. McClintock, however, pointed hopefully to an awakened appreciation of the fact that continuity of plant operation has a definite place in the economic scheme of community. Hence, he believed that in the future many labor disorders, organized with little or no cause by minority factions and often with the sympathy of local politicians will receive less sanction from the public in general, with salutory effects, from the standpoint of all.

He cited the difficulty now being experienced in many cities in obtaining skilled men and emphasized the desirability of a systematic apprenticeship training at foundries to combat the situation, which will probably get worse before it gets better.

A campaign against excessive taxation was outlined by Wallace Borne, of the J. Walter Thompson Co., New York, in an address entitled "A Plan for Industrial Co-operation Proposed by the National Business Conference Committee," an address which was originally to be presented by Lewis H. Brown, president, Johns-Manville Corp., New York, but who at the last minute was unable to attend.

Mr. Borne described the campaign as primarily an advertising campaign which would be sponsored by various business organizations and groups in an effort to awaken public interest in a reduction in government spending and government taxation. He described the tax situation as becoming increasingly critical.

Describes Apprentice Training

Current evidence warns of a shortage of skilled craftsmen in the steel foundry and other industries connected with steel, in the opinion of Franklin R. Hoadley, vice president, Farrel-Birmingham Co., Inc., Ansonia, Conn., in describing the apprentice system in that plant and the lack or suspension of such a system in others.

If, in the opinion of Mr. Hoadley, industry finds difficulty in securing skilled men today, what will happen in the future when frozen credit is released and the heavy industries are called upon to meet the long pent-up demand?

The Farrel-Birmingham system is designed to develop the use of brains in industry as well as hands. Many firms have not put on new apprentices in the last five years. Assuming the life of a mechanic is 30 years, the steel foundry industry has lost in these five years 16½ per cent of its mechanics because of death and incapacity among other factors, Mr. Hoadley pointed out.

16 Tons of Steel in This Chicago House

A STRIKING modern home of steel is this residence just completed by General Houses Inc., 220 South State street, Chicago, for Frank P. Ross, of Oak Park, Ill., at 1506 Bonnie Brae place, River Forest, Ill., a suburb of Chicago. Mr. Ross, co-founder of the Jewel Tea Co., purchased it through John Cummings Lindop Real Estate Inc. on a development basis.

The dwelling was designed by Howard T. Fisher, president and chief architect of General Houses. It contains nine rooms besides laundry, utility room, and an attached two-car garage. It embraces more than 30,000 cubic feet of usable space. More than 16 tons of steel was used.

There are 42 windows in the house, and a large roof deck for living and recreation purposes in season. Insulated throughout with rock wool, it is equipped with winter air-conditioning and is heated with warm air from a gas-burning unit.

The interior has been decorated by Mrs. Charles W. Stiger Jr., of River Forest. Especially interesting is the use of mahogany plywood for some of the interior walls, and the color schemes chosen for other surfaces.

Labor

GENERAL ELECTRIC CO., Schenectady, N. Y., will terminate on Dec. 31 its unemployment compensation plan into which employes of the company have contributed over $7,000,000 in the past 5½ years. This termination coincides with the inauguration of the federal social security act Jan. 1.

Now on hand in the GE fund is $3,000,000, of which $1,750,000 is in the local works funds and $1,250,000 in the general fund. The $1,750,000 will be liquidated and employes will vote on its disposition.

EMPLOYES OPPOSE ELECTION

Claiming a membership of 3500 of the 4800 workers in the Portsmouth, O., plant, employes in 20 departments of Wheeling Steel Corp. went on record recently against efforts to force a collective bargaining election. At the same time, the Amalgamated Association of Iron, Steel and Tin Workers claimed membership of more

than 3000, so that a petition of the Amalgamated to hold an election in the Portsmouth plant was being heard before a federal court in Cincinnati. Hearings continued all last week without definite decision being reached.

END ALABAMA COAL STRIKE

Strike of coal miners in Alabama was settled Nov. 16 when operators conceded an increase of 4½ cents in the tonnage rate and 25 cents in the day rate—less than half what miners demanded.

CUTLER-HAMMER VOTES BONUS

Cutler-Hammer Inc., Milwaukee, has announced a bonus of 3 per cent on 1935 earnings to be paid all office and shop employes. The company has declared a dividend of 25 cents a share, payable Dec. 16 to record of Dec. 5—the first dividend since Sept. 15, 1930.

Housing

AMERICAN Institute of Steel Construction, Concrete Reinforcing Steel institute, Metal Window institute and 12 other representative trade associations, participants in the building materials industry conference, have joined in a letter to President Roosevelt requesting an early explanation of the government's aims and purposes in housing operations, in order that private industry may proceed intelligently and definitely in the housing field.

The letter refers to the multiplicity in number and, in some cases, the apparently conflicting and competitive character of the government agencies having to do with housing, and asks how far the government itself proposes to go in the housing business. It is emphasized that present confusion in the minds of industry is operating to dam up the flow of funds and materials needed to make good the present housing shortage.

Edge Moor To Liquidate

The board of Edge Moor Iron Co., Edge Moor, Del., has recommended that the company be liquidated. Assets will be distributed to the various stockholders and no additional work will be accepted. The liquidation action will be submitted to stockholders at a meeting Dec. 10.

The company was started 60 years ago by the late William Sellers, who became president in 1869. His son, William F. Sellers, became president in 1905.

Expect Trade Pact To Spur Steel and Machinery Exports

ON THE whole, the new trade agreement ratified by the United States and Canada Nov. 15, announced Nov. 18, and effective Jan. 1, is expected to stimulate exports of iron, steel, machine tools, equipment and other products of the metalworking industry.

Duties on imports of many animal, vegetable, mineral, fishery, and forest products, and some manufactured articles from Canada are reduced.

For the iron and steel and allied industries the chief products thus affected are ferromanganese, ferrosilicon, ferrotitanium, ferrovanadium, ferrouranium, and dead-burned basic refractory material.

In return for this lowering of the tariff walls of the United States, Canada is reducing its import duties on practically all iron and steel products and many important lines of machinery and equipment. Generally, machinery which has been dutiable at 35 per cent now takes a rate of 25 per cent.

Farmers Voice Protest

Typical reductions in rates on exports to Canada are sheets from $7 a ton to $6, bars and plates from 30 per cent to 25, malleable castings from 27½ per cent to 25, steel wire from 7½ per cent to 5, and tin plate from 15 per cent to 12½.

Agricultural interests are protesting against the reduction in duties which will let in considerably more Canadian farm products. Industry as a whole appears to have received a good break, because the lower duties on products that are competitive apply to a negligible proportion of this country's consumption.

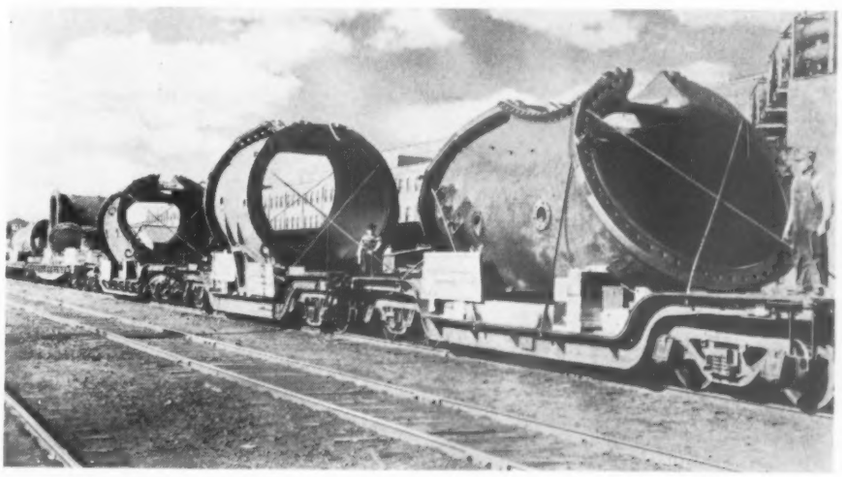
Because of "most favored foreign nation" provisions many of the reductions in duties on imports will apply also to other nations, but since the great bulk of these imports is received via Canada, the adjustment between the United States and Canada represents practically the entire impact of the new agreement.

Reaction Is Awaited

The first repercussion of the new agreement is expected in the ferromanganese market, and the possibility of a reduction in ferromanganese for 1936 was the basis for speculation last week as a result of the combined operation of the reduction on the duty on manganese ore from Brazil and on ferromanganese from Canada, under the new agreements with both countries. At present, the market on ferromanganese is $85 per gross ton, duty paid Atlantic and Gulf ports.

According to leading trade interests in New York, the new duty on ferromanganese beginning Jan. 1 will be $17.92 per gross ton, compared

To Transmute Water Into Electricity at Boulder Dam



First shipment of six cars from the Allis-Chalmers Mfg. Co., Milwaukee, carrying the spiral casing of one of the four record-size hydraulic turbines developing 115,000-horsepower per unit for Boulder dam. Each complete turbine will require 26 cars to transport its weight of 1,250,000 pounds. Through each of these turbines in 24 hours will flow water sufficient for the daily needs of a city the size of Detroit

with the present impost of $33.60—a condition which many believe not only definitely precludes the advance which otherwise might have been inaugurated but also probably will result in some decline.

In any event, it is improbable that anything like the full decline can be passed on to consumers. For one thing, prices on manganese ore are strong and may be advanced at any time. Domestic producers of ferromanganese will benefit by not more than $5.60 a ton on manganese ore, which is the reduction in the tariff under the Brazilian treaty just ratified by the Brazilian government and to become effective 30 days after its acceptance by President Roosevelt.

How New Rate Is Figured

The method of calculating is much as follows:

The present rate of duty is 1⅞ cents per pound and on a basis of 80 per cent ferromanganese this would result in the duty of $33.60. The new duty, under the Canadian agreement, provides for a maximum of 1⅝ cents per pound, or $29.12. However, the new tariff proposed by the Canadian treaty also specifically provides, subject to the above maximum, that the duty on ferromanganese must be 1¼ times the duty on manganese ore plus ⅜ cents.

Hence, 1¼ times 1792 pounds (80 per cent of 2240 pounds) is $22.40. This divided by half, which will be necessary under the 50 per cent reduction in duty on manganese ore under the Brazilian treaty, results in $11.20, to which must be added ⅜ cents times 1792, or $6.72, for the above mentioned total of $17.92.

The outstanding reductions in duties on exports to Canada are listed in the table on this and the following page. In addition to the aforementioned adjustment in ferromanganese, the revised duty on ferrosilicon (8 to 60 per cent) from Canada is 1½ cents per pound of silicon content, compared with the former rate of 2 cents, while on ferrotitanium, ferrovanadium, and ferrouranium the cut is from 25 per cent to 15. Dead-burned basic refractory material will come in at 27½ per cent instead of 30.

Obviously, at this time there can be only speculation concerning any improvement in demand for American steel and machinery in Canada. Washington, of course, assumes that there will be a substantial increase, probably in those products in which most trading has been done in the past, such as bars, plates, shapes, sheets, billets, rods, rails and accessories, forgings, axles, and bolts and nuts.

The new tariff schedule was introduced Nov. 18 by the President with a grand flourish (p. 22) before assembled newsmen and state department experts.

From Toronto comes word that the reception accorded the new agreement reverses the sentiment in the United States. In this country, naturally, agriculture is aroused over the prospect of stiffer competition from Canada, while industry visions a less trammeled outlet. In Canada, agriculture is pleased over its broader markets to the south, while industry is a little apprehensive over the certainty of expanding imports.

At present, there is practically no heavy structural steel demand in the Dominion, owing to stagnation in building. Demand for pig iron for several years has been almost entirely met by Canadian blast furnaces, and present Canadian prices are practically on a parity with those in the United States.

Impetus for Equipment

General business in the Canadian iron and steel markets has been showing considerable expansion in recent weeks, and further impetus in this direction is expected with the new agreement, chiefly in creating a larger domestic market for various lines of iron and steel products such as farm implements, electric stoves, refrigerators, and many other commodities that come under this head.

Canadian steel mills today are operating at the highest rate since 1930, and there are indications of further expansion. It is expected that the revised tariff on steel commodities will not have any general effect in the way of curtailment in plant operations, but through more widespread imports from the United States may stimulate business in all directions.

Changes in Duties on United States Exports to Canada

Unit of duty is ad valorem where the rate is a percentage. Phrase "n.o.p." means not otherwise provided for. Effective Jan. 1, 1936.

	Present duty to U. S.	New duty to U. S.	Approx. Reduction in Duty
Wire of all metals and kinds, n.o.p.	35%	30%	14%
Wire, insulated	30%	27½%	8%
Wire, twisted, etc.	25%	22½%	10%
Wire cloth, etc.	25%	22½%	10%
Mfrs. of brass or copper, n.o.p.	30%	24¾%	17%
Screws of brass, copper, n.o.p.			
(a) Wood screws	35%	30%	14%
(b) Machine and other screws	35%	30%	14%
Nickel kitchen or household hollow-ware, n.o.p.	30%	27½%	8%
Anodes of nickel, zinc, etc.	10%	7½%	25%
Ferroalloys, per pound			
(a) Under 1% silicon	1¼c	1c	20%
(b) Over 1%	1¾c	1½c	14%
(c) Between 8 and 60%	1¾c	1½c	14%
(d) Between 60 and 90%	2¾c	2½c	9%
(e) Over 90%	5½c	5c	9%
Ingots, etc. under 3c lb. for steel mfg.	5%	Free	100%
Bars and rods, billets, iron and steel under 60 lbs. per yd.			
(b) Not further mfd. than hammered, etc., n.o.p.	30%	25%	17%
(c) Cold-rolled, etc., n.o.p.	30%	25%	17%
(d) Hot-rolled 4c per lb. or over	15%	12½%	17%
Bars and rods, iron and steel, inc. billets under 60 lbs., hot-rolled, etc., per ton			
(c) Bars for shovel mfrs.	$3	$2.75	8%
Plates, iron and steel, hot or cold-rolled			
(b) Over 66 in. in width, n.o.p.	30%	25%	17%
Sheets, iron and steel, hot or cold-rolled			
(b) Over 0.080 in. thick, per ton	$7	$6	14%
Hoop, band or strip, iron and steel:			
(d) Cold rolled, etc., over 0.080 in. thick	30%	27½%	8%
Sheets, plates, hoop, etc., iron and steel			
(d) Coated with metal or metals, n.o.p.	15%	12½%	17%
(e) Coated with paint, tar, etc.	15%	12½%	17%
(f) Coated with vitreous enamel, n.o.p.	25%	20%	20%
(g) corrugated	25%	20%	20%
Sheets, plates, hoops, etc., iron and steel, hot rolled over 5c per lb.	15%	12½%	17%
Sheets, plates, hoops, etc.			
(b) For mfg. typewriters, etc. (cold rolled)	10%	7½%	25%
(c) Hot or cold rolled for mfg. shovels, per ton	$3	$2.75	8%
(h) Hardened, tempered, etc. for mfg. saws	12½%	10%	20%
(i) For mfg. clasps, casters, etc.	5%	Free	100%
(j) Tagging metal for mfg. shoe laces, etc.	5%	Free	100%

	Present duty to U. S.	New duty to U. S.	Approx. Reduction in Duty
(k) Sheets for mfg. hollow-ware, etc.	12½%	10%	20%
(l) Sheets, etc. for mfg. cooking or heating apparatus	12½%	10%	20%
Railway rails, etc., n.o.p.	$7	$6	14%
Railway ties, etc.	$8	$7	12%
Railway switches, etc.	30%	25%	17%
Iron or steel angles, beams, etc. and piling, less than 35 lbs. per lin. yd., per ton	$3	$3	....
Beams or joists, iron and steel, etc. under 5½ lbs. per lin. yd.	17½%	12½%	29%
Angles, beams, etc. further mfd. than hot rolled, etc.	40%	35%	12%
Castings of malleable iron	27½%	25%	9%
Castings of iron, non-malleable, n.o.p.	27½%	25%	9%
Castings of steel, n.o.p.	27½%	25%	9%
Piston ring castings of steel, etc.	27½%	25%	9%
Castings, iron and steel:			
(b) Being molds, n.o.p.	10%	7½%	25%
Forgings, iron and steel, n.o.p.	30%	27½%	8%
Axles and axle bars, n.o.p., blanks and parts, etc.			
(a) For railway vehicles	30%	27½%	8%
(b) For other vehicles	35%	30%	14%
(c) n.o.p.	30%	27½%	8%
Pipe, cast, iron and steel, under 5c per lb., per ton	$14	$10.80	23%
Pipe, cast, iron and steel, n.o.p.	10%	7½%	25%
Pipes and tubes, plain or coated:			
(a) Welded or seamless, under 10½ in. diam.	30%	27½%	8%
(b) Welded, etc. over 10½ in. diam.	20%	15%	25%
(c) Not jointed, under 2½ in. diam.	15%	10%	33%
(d) n.o.p.	30%	27½%	8%
Fittings, iron and steel, for pipes and tubes	30%	27½%	8%
Woven wire fencing, etc.	15%	12½%	17%
Woven wire fencing, wire cloth, wire netting, coated or not	35%	30%	14%
Woven netting, coated, etc. for fur farms	30%	27½%	8%
Wire of steel:			
(a) Spring, etc., for mfg. mattresses, etc.	7½%	5%	33%
(c) Over 2¾c lb. for mfg. wire rope	7½%	5%	33%
(d) Single, etc. for commercial fishing	10%	7½%	25%
Springs, iron and steel:			
(a) For running gears of R. R.	30%	27½%	8%
(b) For running gears of other vehicles	35%	30%	14%
Springs, iron and steel, for mfg. clocks	10%	7½%	25%
Silent chain and finished roller chain, etc.	25%	20%	20%
Chains, iron and steel, n.o.p.	35%	30%	14%
Cultivators, harrows, etc.	25%	12½%	50%
Ploughs; farm, etc., rollers, etc.	25%	12½%	50%
Mowing machines, harvesters, etc.	25%	12½%	50%
Hay loaders, potato diggers, etc., and all other agricultural implements and machinery, n.o.p.	25%	12½%	50%
Hay presses, etc.	25%	12½%	50%
Scythes, sickles, hoes, rakes, n.o.p. (ex) scythes and sickles	25%	12½%	50%
Traction engines for farm purposes, and parts	Free	Free	....
Portable engines and traction engines for farms, n.o.p.	25%	....	....
Machinery, etc., for cleaning coal, making gas and coke, etc.	12½%	10%	20%
Equipment for stone dust and mines	10%	5%	50%
Ore crushers, coal cutters, etc., for mining	25%	20%	20%
Pumps, etc., for extracting precious metals, etc.	20%	17½%	12%
Power driven pumps for underground mining	27½%	25%	9%
Blowers, iron and steel, for smelting ores, etc.; etc.	20%	17½%	12%

	Present duty to U. S.	New duty to U. S.	Approx. Reduction in Duty
Machinery n.o.p. for concentrating, etc. of ore, etc.	20%	17½%	12%
Heavy duty mine hoists (not made in Canada)	10%	5%	50%
Machinery, etc., for reclaiming certain particles from industrial plants	12½%	10%	20%
Adding, bookkeeping, calculating, etc., machines	25%	20%	20%
Vacuum cleaners, etc., and parts	25%	20%	20%
Refrigerators, domestic or stores:			
(i) Electric	40%	30%	25%
(ii) Other than electric	30%	27½%	8%
Washing machines, parts, etc.	35%	25%	29%
Clothes wringers, etc.	35%	30%	14%
Sewing machines and complete parts, etc.	25%	15%	40%
Concrete paving machines, etc., not made in Canada	12½%	10%	20%
Certain digging machines	15%	10%	33%
Electric dental engines	35%	30%	14%
Hand fire extinguishers and sprinkler heads	35%	30%	14%
Lawn mowers	32½%	30%	7%
Wire stitchers and staplers, not including motive, and parts	35%	5%	86%
All machinery composed wholly of iron or steel, of a kind not made in Canada, and parts	35%	20%	43%
All machinery wholly or in part iron and steel, n.o.p. and parts	35%	25%	29%
Ball and roller bearings	35%	27½%	21%
Diesel and semidiesel engines and parts	30%	25%	17%
Air cooled int. comb. engines under 1½ h.p.	30%	25%	17%
Cutlery, iron and steel:			
(a) Knife blades, table forks in rough, etc.	10%	7½%	25%
(b) Table knives and forks	35%	30%	14%
(e) Spoons	35%	30%	14%
Nuts and bolts, etc., iron and steel per 100 lbs	75c	50c	33%
and ad valorem	25%	18%	28%
Hinges and butts, iron and steel, etc., per 100 lbs	75c	75c	....
and ad valorem	25%	24¾%	18%
Screws, iron and steel:			
(I) Wood screws	30%	25%	17%
(II) Machine and other screws, n.o.p.	30%	25%	17%
Wire roofing nails, all sizes, and wire nails over 1 in.	60c	55c	8%
Cut nails	50c	45c	10%
Shovels and spades, n.o.p.	20%	15%	25%
Axes	20%	15%	25%
Certain precision tools	30%	25%	17%
Hollow-ware, iron and steel, n.o.p.	30%	27½%	8%
Kitchen and dairy hollow-ware, iron and steel, tin-plated, etc.	30%	27½%	8%
Hollow-ware, enamelled	35%	30%	14%
Containers, tin plate, for mfg. food products	25%	22½%	10%
Mfrs. of tin plate and of tin, n.o.p.	30%	27½%	8%
Bathtubs, sinks, etc., iron and steel	35%	25%	29%
Locomotives, motor cars for R.R. and certain parts	35%	30%	14%
Chassis for motor cars for R.R., n.o.p.	35%	30%	14%
Pressed steel wheels for railroads	35%	30%	14%
Locomotives and motor cars for railroads (not made in Canada) for mining, etc.	20%	15%	25%
Railway cars and parts	30%	27½%	8%
Locomotive and car frames	35%	20%	43%
Manufactures of iron and steel, n.o.p.	35%	25%	29%
Steel wool	10%	7½%	25%
Steel balls under ⅜ in. (burnishing balls)	10%	7½%	25%
Ball bearings	10%	7½%	25%
Skates of all kinds	30%	25%	17%
Pressed steel belt pulleys	27½%	25%	9%
Firebrick of silica, magnesite, etc.	Free	Free	....
Firebrick, n.o.p. for furnaces, etc.	15%	12½%	17%

Production

STEELMAKING rebounded 2½ points last week to 54½ per cent. This level was attained in only three other weeks of the year, namely, the first two weeks of February and the first week of November. Heavier schedules were noted in the Youngstown, Chicago, Pittsburgh, Cleveland, and Detroit districts. Other districts were fairly steady, with the exception of Wheeling and Birmingham, which showed slight declines. Further details follow:

Youngstown—Gained 3 points to 56 per cent last week, and is expected to climb 1 or 2 points higher at this week's start, if tentative schedules are carried out.

Pittsburgh—Up 2 points to 46 per cent, owing largely to a gain in operations of Steel corporation subsidiaries. The leading interest closed last week at 42.43 per cent for the Pittsburgh and Youngstown districts, or about 35-36 per cent for the Pittsburgh district proper. Led by a 58-60 per cent rate of production by the leading independent, the district's independent mills averaged 52 per cent operations last week.

Twenty-six out of 60 steelworks blast furnaces are active. Carnegie-Illinois Steel Corp. has 11 of 32 on; Jones & Laughlin Steel Corp., 8 of 11; National Tube Co., American Steel & Wire Co., Pittsburgh Steel Co., and Pittsburgh Crucible Steel Co., 1 each. Bethlehem Steel Co., at Johnstown, Pa., is operating three.

Chicago—Increased for the fourth consecutive week, the latest gain of 4 points bringing operations to 61 per cent, the highest rate since early February. Ingot production is relatively higher than finishing mill schedules. Blast furnace operations are unchanged, 19 of 41 stacks on.

Detroit—Up 6 points to 94 per cent, there being 16 out of 17 open-hearth furnaces in production here.

Wheeling—Off 6 points to 78 per cent last week, with 29 out of 37 open-hearth furnaces making steel, against 31 active the week preceding.

New England—Held at 93 per cent last week, two companies operating at capacity. This rate will fall slightly this week.

Cleveland-Lorain—Up 3 points to 80 per cent, Corrigan,McKinney Steel Co. lighting another open hearth to operate 13; Otis Steel Co. continuing with eight, and National Tube Co., Lorain, with ten.

Buffalo—Held at 37 per cent last week, with a small prospect of a change now that the navigation season is practically at an end.

Central eastern seaboard—Unchanged at 39 per cent. Should prices be increased, as many believe is probable on certain products, stimulated buying will give ingot output a boost before the end of the year.

Birmingham—Down 11½ points to 46½ per cent, with 11 open hearths melting. Demand for various shapes of steel continues good and rail rolling is scheduled for all December.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Nov. 23	Change	Same week 1934	Same week 1933
Pittsburgh	46	+ 2	21	22
Chicago	61	+ 4	33	29
Eastern Pa.	39	None	20	17
Youngstown	56	+ 3	35	32
Wheeling	78	— 6	54	51
Cleveland	80	+ 3	46	48
Buffalo	37	None	24	32
Birmingham	46½	—11½	25	20
New England	93	None	55	75
Detroit	94	+ 6	48	36
Average	54½	+ 2½	29	28½

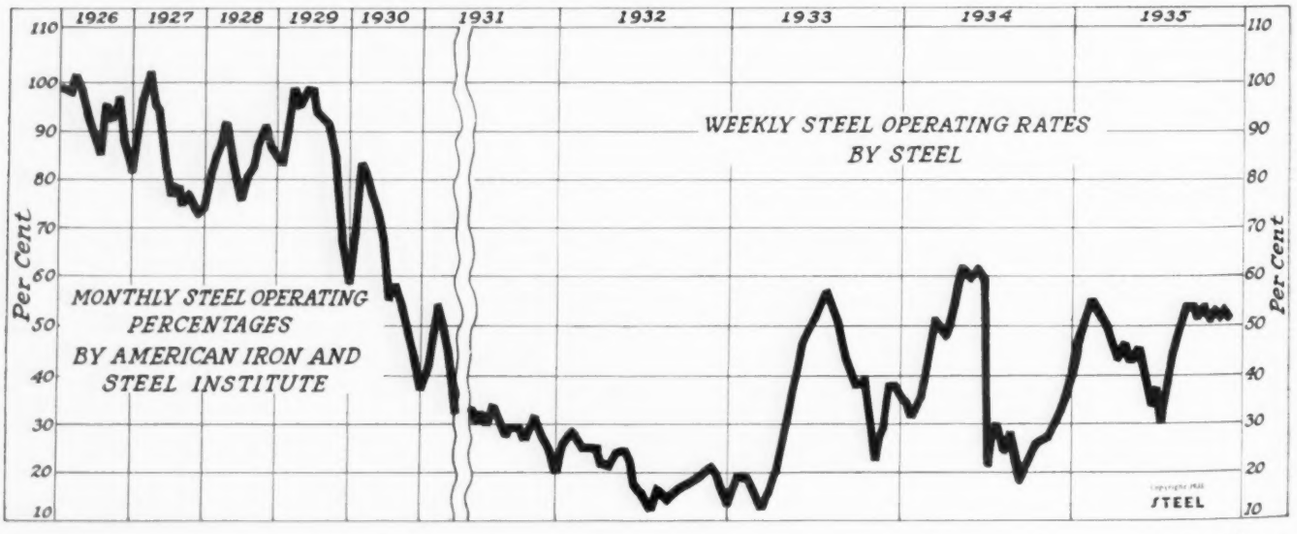
SHEET STATISTICS IMPROVE

Daily average sheet steel sales, production and shipments increased in October, according to the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. Sales averaged 7297 net tons, up from 6547 tons in September; output 7192 tons, compared with 6357 tons; and shipments 7114 tons, against 5897 tons in September. Totals for the month: Sales, 226,209 tons; production, 222,963 tons; shipments, 220,536 tons. Total sheet capacity in the country for the month was approximately 500,000 tons, and the capacity on which the association's figures are based was 303,000 tons.

Foreign Trade

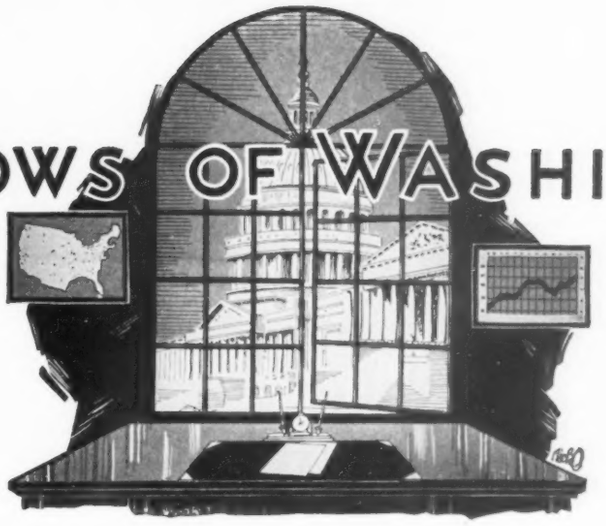
IRON and steel exports in October totaled 238,358 gross tons, a decrease of 2½ per cent from September. Exports of scrap and heavy rails to Japan were the lowest for many months. An increase in exports of skelp, steel bars, car wheels, axles and wire was noted.

Steel Production Rate Shows Almost Level Plateau for Fifteen Weeks



For 15 weeks operations of the steel industry have swung within the narrow range of 3½ points, between 51 and 54½ per cent of ingot capacity. This indicates an unusually steady condition of demand and production, as is shown in the above chart, coverng the past ten years

WINDOWS OF WASHINGTON



WASHINGTON

EVERY possible effort is being made by Maj. George L. Berry, co-ordinator for industrial cooperation, to drum up trade for his so-called industry-labor conference to be held here Dec. 9.

He is making speeches before groups of manufacturers — when they will listen to him; he is having conferences of groups in his offices here, and when no one will come here he is flitting hither and yon to talk with groups of manufacturers.

In other words, he is trying to line up his conference in advance. He wants to know just where the various industries stand regardless of written communications.

In the meantime, President Roosevelt, whom Major Berry confidently hoped could be persuaded to make an opening speech at the conference, has got off the hook and will be in Chicago on the opening day, Dec. 9, addressing a group of farmers.

Extensive Build-Up

There is one thing that industry will have to take into account in utterances of the major. He refers continually to "industry"—"this is industry's party," and the like. By industry he means labor and management and not just management—the generally-accepted meaning. In this regard he has fooled a lot of the manufacturers during the past few weeks. Whatever he does and says he includes labor.

In connection with the forthcoming conference, the Berry publicity machine—which is plenty busy these days, announcing all of the acceptances to the conference and few of the rejections—states that these acceptances are "pouring in daily."

Plans for organizing the conference are going forward rapidly, and the major's office has under consideration the possible necessity of changing the conference location from the federal auditorium, where it was originally announced that the conference would be held, to a larger auditorium.

Following the meeting which will open the conference, which will be brief and be limited to an outline of procedure by Major Berry, the separate groups of industry and labor for related industry groups will be assigned to meeting places.

The assignment of conference members to industry groups, it is said here, will in no sense be arbitrary, and participants may indicate their desire to be associated with another group or meet by themselves if objection is made to the suggested classification.

Spokesmen To Be Selected

The conferences by industry groups will be private, and no government representatives will be present unless sent for by the conferees.

According to the Berry officials, the groups will be requested after "a reasonable lapse of time" to select one or more spokesman to represent them in a council of industrial progress, as it will be called, which will convene as soon as all groups have concluded their sessions.

Major Berry insists that his opening remarks will only lay before the conference the important problems at present before industry and will outline his plans by which the meetings will be invited to arrive at conclusions for their solution. No plan will be put forth from government sources, it is insisted, and none will be formulated.

The number of separate groups set up for industry management will be devised from arrangements worked out by the Berry lieutenants. Labor meetings will also be established from groupings of labor organizations which will correspond, as definitely as possible, to the industries which they serve.

There has been the strictest censorship on the part of the Berry publicity organization regarding the answers received by Major Berry from firms and trade associations. Effort has been made to get all of the answers but this has been refused.

The publicity department has put out a few acceptances and practically no rejections each day. It is admitted that literally dozens and almost hundreds of letters are being received, and at the end of last week, for example, on one day there were about ten acceptances and one rejection. The next day nothing was given out.

However, the same department has given out a "partial" list of acceptances, with no rejections attached, including many large companies. The Truscon Steel Co., is in this list. Others included in this "partial" list are the Remington Rand Co., Timken Roller Bearing Co., International Nickel Co., Johns-Manville Co., American Smelting & Refining Co., and many other similar organizations.

More "Guffey" Legislation?

Mention was made in these columns some weeks ago that it was reported that NRA officials were writing bills similar to the Guffey act for various industries. It develops now that one such bill has been written for the forest products industries.

Along this line, Senator Guffey, of Pennsylvania, father of the coal act, has announced that if his coal control law is upheld by the United States Supreme Court the same kind of legislation will be applied to a number of other industries.

The senator states that already he has been urged by anthracite coal miners and operators to apply a similar control to their industry.

Some manufacturing industries, he states further, also have asked

for extension of the principle of the Guffey law to their fields.

In this connection Senator Guffey; "I'll do nothing further until a decision is rendered by the Supreme Court, and I am confident that will be a favorable decision."

NRA STEEL STUDY DRAGS; NOT TO BE COMPLETED DEC. 1

A. G. White, who has taken the place left vacant by R. W. Shannon, resigned, in charge of the NRA steel survey, states that because of curtailment of personnel and resignations that this report will not be ready by Dec. 1 as asked for by the President. It will be delayed "several weeks," Mr. White says.

Mr. White believes that a "progress report" can be made to NRA officials shortly after Dec. 1, but this will in no sense be anything like the preliminary report that was supposed to be ready at that time. In fact, some of the studies are already in their preliminary form.

It is reported that only a small number of the questionnaires sent out some weeks ago have been returned in their completed form.

Mr. White, who called off the copper study to succeed Mr. Shannon, for several years was an assistant professor of geology at the University of Pennsylvania and later was attached to the United States bureau of mines as a geologist. From 1929 to 1933 he was with the National Industrial Conference board as an economist.

"CAPTIVE" COAL MINES HELD SUBJECT TO GUFFEY LAW

While never having issued anything official, the national bituminous coal commision, operating under the Guffey law, has considered all along that "captive" coal mines owned by steel companies are subject to the Guffey act.

While no tabulation has been made up to this time by the commission on "captive" coal mines, it is reported at the offices of the commission that some steel "captive" mines have voluntarily signed up with the commission while others have not. It is impossible to get any names at this time. On the other hand, on the outside, it is reported that no such mines have signed up with the commission.

The coal commission last week sent a letter to federal purchasing agents in which it takes the stand that all purchases, of course including steel, have to be made under the Guffey law on government contracts from firms purchasing their coal from mines operated by producers complying with the Guffey act.

This was intimated in these columns last week, but at that time there was nothing official. Now the commission has made a ruling as outlined in its letter to the purchasing agents of the government.

The commission's letter pointed out also that the term "contractor" applies likewise to subcontractors.

Before awarding contracts to the lowest bidder, the obligation of the contracting officer will be satisfied, the letter explained, "if the name of the producer delivering coal to the contractor appears on the latest list of code members furnished by the commission."

The commission's letter said that "every contract (for any public work or service) entered into by or on behalf of the government" requires the application of section 14 of the act.

This was in response to a request from the procurement division of the treasury department for an interpretation of section 14, and follows a statement of the commission on Oct. 28 that it "will apply to railroads serving the government in the transportation of mails as well as firms and individuals contracting with the government for the supplying of materials."

The procurement division has directed that provisions requiring the use of code coal be inserted hereafter in government contracts.

"F. D." SHOWMANSHIP GETS FAVORABLE PRESS ON PACT

Any question that the President of these United States might not be the No. 1 showman of the country was dissipated at 2 p.m. on Sunday, Nov. 17, when he put on a show in the state dining room of the White House, at which time the Canadian trade agreement was made public.

On that rainy afternoon, when newsmen were hoping for a good day's rest, they were invited to the White House to join a class in economics with President Roosevelt as "prexy."

They were ushered into the famous East room, when promptly at 2 o'clock the doors were opened, and they went down the main corridor of the White House to the state dining room, where they were given voluminous volumes of various phases of the treaty. There were between 100 and 200 correspondents, men and women, for whom seats had been arranged.

At one end of the long room the President was seated behind an improvised desk, smoking the inevitable cigarette and surrounded by members of the cabinet and many lesser lights, including experts from both the state and commerce departments.

The stage being all set, the President opened the performance by reading one of the statements—that is, those portions which seemed most important to him. Following this, the reporters were allowed to ask questions. Such as the President himself could not answer he referred to the experts, and the answers were forthcoming immediately.

There were any number of "off the record" comments, many of which would be of very considerable interest to certain members of the public. However, that's another story.

The tradition is that "T.R." was a great showman—but when it comes to being a real impresario it must be admitted that "F.D." has it all over his namesake.

It is not hard for the reader to realize just how the President was able to get the first "break" on this story; in other words, get it over to the country as he wanted to, with the matter apparently so open and above board. There were a good many laughs before the end of the afternoon and everyone was "charmed."

Meanwhile, in Canada Minister King has dropped a few hints that the Canadians outsmarted the Yankee traders—but those asides are understood in officialdom, and each party to an agreement always is free to intimate that it got the best of it.

Financial

CONTINENTAL STEEL CORP., Kokomo, Ind., with plants also at Canton, O., and Indianapolis, will pay $11 in back dividends on its preferred stock Jan. 1 to record of Dec. 16, in addition to the regular quarterly dividend of $1.75. Directors of Continental are understood to be contemplating paying the remainder of the arrearage—$10 per share—early in 1936.

CRUCIBLE ALSO PAYING UP

Another producer to cut into dividend accumulations is Crucible Steel Co. of America, New York, which will pay $1 on the preferred Dec. 31 to record of Dec. 15. A 50-cent dividend was paid Oct. 15.

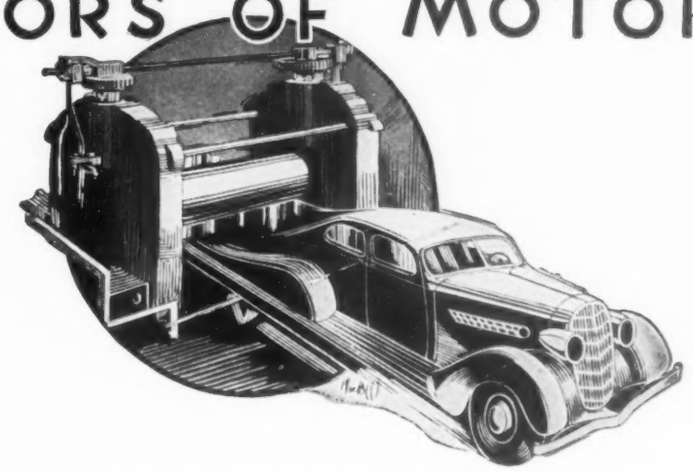
REPUBLIC PAYS PREFERRED

Republic Steel Corp. Friday declared a dividend of $1.50 on its new prior preference stock, payable Jan. 1 to record of Dec. 12. This is the first dividend on this new stock, which is cumulative from Jan. 1, 1935. Julius Kahn, president of Truscon Steel Co., recently acquired, was elected a director of Republic.

APPROVES REORGANIZATION PLAN FOR WICKWIRE SPENCER

A reorganization plan of the Wickwire Spencer Steel Co., New York, was approved last week by Federal Judge Knight in Buffalo. This provides that a new company be authorized with a capital of 500,000 shares of common stock, of which 388,127 shares will be issued to secured and unsecured shareholders, and stockholders are authorized to purchase 98,875 shares at $15 a share. From the RFC in Washington, $1,500,000 will be borrowed.

MIRRORS OF MOTORDOM



DETROIT

IN AN expanding automobile market—such as 1936 augurs—and in a year where model changes generally have revolved around nothing more than radiator grilles and fancier instrument panels, someone in this industry has a mighty fine chance to "go to town" with a radical model.

In other words, Detroit thinks Lincoln's Zephyr, or Auburn's Cord have better than a bright future. Not to infer there will be a runaway in favor of these two cars, but a certain class of buyers has gone on record to divorce itself from the similarity which runs through the General Motors and Chrysler lines, for example.

These days it's hard to tell an Olds from a Buick as it whizzes by, or a DeSoto from a Chrysler. But there's no mistaking at a distance the blunt nose of a front-drive Cord or the deck-hatch hood of a Zephyr. In the true sense of the word, each is a novelty.

5000 Orders for Zephyr

Both, obviously, are handicapped in price from being real volume producers. And both, obviously, do not capture the entire public's fancy. The backers of each model don't have the production facilities to force the low-priced field. But in the so-called upper price brackets, each should carve a sizable niche next year.

Some idea of the pull Lincoln has created lies in its statement last week that the order books list 5000 Zephyrs for December delivery alone. Cord, which went into the shows with nothing but hand-built cars, has set the first week of December for wheels of the assembly lines to turn, and feels highly optimistic.

The automobile industry may have shattered a 35-year precedent to smithereens by moving the shows up to fall, but it is still the only big business known that can charge the public admission to see something it is going to buy, and make them like it.

Motor executives here argue, "We don't want to sell a car to anyone who can't afford to pay to see it." But there is about as much logic in that as arguing for steel prices on an f.o.b. mill base when every finished car produced tacks on freight from Detroit, regardless of what district assembly plant it is made in.

But the American public digests both, and likes it, 1935 being no exception. This fall's showing doubtless inaugurates a policy, for, judging from the New York, Detroit, and Chicago attendances, no ground has been lost in public interest.

Eye Christmas Trade

It is true that attendances are not up to former years, and, for that reason, some producers look on the fall-show idea as purely experimental. But they should not forget that the public had seen many of the new cars on the street, that football games, theatres, and other attractions took away ordinary late-fall attendance.

By their very preparedness to have cars ready for immediate delivery—therefore the fact that everyone saw them running around on the street two weeks before the shows—did the the motor makers defeat their own purpose, if they had one, of setting attendance records.

Now, the next big objective for the motor industry is to carve out a slice of the Christmas trade. Retailers say that $4,000,000,000 will be spent this holiday season. For the motor car people to garner even a 5 or 10 per cent cut in the pie would be something, but hopes are set justifiably higher.

But, to return to production curves. November and December should each be steady at around 375,000 to 390,000 models. Next year may build to a peak in April, after a slowing February. If the 1937 shows come again in the fall, the valleys in production in 1936 will be February and September; February for show reaction, September for retooling.

On the latter point, Detroit entertains some differences of opinion. There are many here who say the industry can't get away with such minor model changes for two years in a row. Motor car makers never before went in for the yellows, tans, and greens that they did this year, but Detroit argues that you cannot doll up a car just by painting it light and call that a major point of difference from the preceding model. Too, the historians recall with facts that major mechanical changes come in two-year cycles and 1937 goes down on the calendars as the next one to expect.

Of all the revisions to be made "under the hood" the story Detroit likes best to repeat is the rear-engine car. Stout, as the public has been informed by now, pioneered it and already has a feeler out in "production of 100 Scarab rear-engine cars for 1936."

Novel Designs Being Tested

The big thing, of course, would be for Chrysler or General Motors to take it on. Each has been experimenting with a rear-engine model, which may or may not be news. Out at Milford, the General Motors' proving ground, they've had a rear-engine car running around for the last few years.

But they also have had a cheap air-cooled car and flock of other novelties for the proving ground mechanics to tinker with. So, there's a good chance, and yet there isn't a good chance, for one of the big motors makers to throw a real threat. For one thing, there is everything new under the sun to choose from, that is, on the proving grounds.

Ever since the days when the brass radiator, linen duster, and acetylene lamp were vogue, the automobile has been basically the same—motor in front, four wheels, seats transverse. You can streamline to your heart's

content, but you get back to that basic formula.

Now, to set an engine in the rear, make the seats adjustable to any position and, in fact, to retain only the four-wheels-per-car idea, is a plunge off the spring-board.

A General Motors executive recently answered the question of when General Motors will come to the rear engine car by inferring that if the Stout car goes over this year, it would be inevitable. Obviously, the buying public is the test tube; if it wants cars with red-white-and-blue windshields, the motor people will make it for them.

So, whatever the 1937 concentration is on—be it engines, chassis, or brakes—it's a foregone certainty that a lot of money will be spent for the purpose. The motor people got by this year by equipment-spending almost entirely on big presses. Practically no attention was given equipment for motor, piston, or cylinder work.

Costs Important Factors

Maybe the next ten months will see a wide swing over to the chassis-less car, like the Chrysler, DeSoto, and Lincoln-Zephyr type of bridge-deck construction. If riding qualities come under the microscope, the trend certainly will be toward lower-hung bodies. The only sure way now to circumvent the overall-height problem is to drop close to the road; meaning that the conventional frame, as we have come to know it, is out.

One thing that keeps the brakes on and holds the two-year cycle rule as a pretty sure one is amortization. For instance, Plymouth wiped out costs this year on the front coil-spring version of "knee action," dropped the idea entirely, and went back to leaf springing for 1936.

Cadillac, just as an example of General Motors units, is reported to consider $3,500,000 as the amortization figure on knee action. All of the body plants usually figure on two-year die life. When costs have been met, or even approximated, look out for machine replacement.

For production-line equipment that's almost an inviolate rule. But for machinery in the tool rooms, there is an overdue obsolescence. In their haste to get the production lines going, the motor makers always overlook modernization of the second-line trenches.

At Chrysler, for example, it is stated that 57 per cent of its tool-room machines are ten years old or older, and Chrysler is no exception. The machine tool people are looking enviously for this flood of business to break.

Out in the plants, it's a draw right now between Chevrolet and Ford, battling it at 25,000 jobs weekly apiece. Plymouth is snug in third place at 11,500 weekly and is just beginning to feel its oats for the first time through the use of the new plant space it took on a few months ago. They are still talking 500,000 Plymouths for 1936.

Dodge at 7000 jobs per week corrals fourth place, and then in quick succession come the assembly rates of Pontiac, Olds, and Buick, each one hugging the 5000-model-per-week sum. Hudson is just slightly less, at 3500.

In current output, Packard, Chrysler, DeSoto, Studebaker, and Nash make up the motordom bracket that sent off approximately 1500 models each last week. The others in the passenger car field, eight in number, each made something less than 1000 jobs for the week.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115,272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,321
July	229,357	264,933	337,044
Aug.	232,855	234,811	240,051
Sept.	191,800	170,007	89,805
Oct.	134,683	131,991	*200,000
10 mo.	1,768,809	2,516,005	3,129,045
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Nov. 2	76,740
Nov. 9	89,095
Nov. 16	93,177
Nov. 23	94,723

Light Steel Gains Faster Than Heavy

SHIPMENTS of steel and iron products by 200 members for third quarter and nine months of 1935 have been compiled and announced by the American Iron and Steel institute, New York.

Products for sale, less shipments to members for conversion, during third quarter of 1935 totaled 5,236,095 gross tons, representing 44.7 per cent of finishing capacity, compared with 3,151,305 gross tons, or 27.1 per cent of capacity, for third quarter of 1934.

For nine months of 1935 production, less shipments for conversion, totaled 15,752,099 gross tons, 44.8 per cent of capacity, compared with 15,986,373 gross tons, or 40.1 per cent of finishing capacity, in nine months of 1934.

Light steel products continued to lead in per cent of capacity engaged, but practically all classifications showed an increase over 1934. Tin plate, which was at 51.6 per cent in third quarter, 1934, showed 70.6 per cent for third quarter of 1935 and 67.5 per cent for nine months of 1935. Sheets made an even greater gain; third quarter, 1934, showed 27.4 per cent, third quarter, 1935, 61.4 per cent, and for nine months, 1935, 6.55 per cent. Heavier products like nails, bars, and plates made relatively less increase. Details of production are given below:

	SHIPMENTS		
	Third Quarter 1935	Nine Months 1935	Nine Months 1934
STEEL PRODUCTS			
Ingots, blooms, billets, slabs, sheet bars, etc.	991,107	3,058,485	2,465,113
Heavy structural shapes	358,507	944,337	903,635
Steel piling	37,096	94,505	80,069
Plates—Sheared and Universal	347,533	950,539	1,016,064
Skelp	115,798	278,979	273,344
Rails—			
Standard (over 60 lbs.)	112,196	467,462	873,151
Light (60 lbs. and under)	9,539	39,791	52,763
All other (Incl. girder, guard, etc.)	9,723	25,074	27,575
Splice bar and tie plates	57,822	194,456	284,674
Bars—			
Merchant	670,553	1,904,583	1,518,498
Concrete reinforcing	38,904	346,763	373,011
Carbon—			
Cold finished	117,405	352,178*	261,012
Alloy—Hot rolled	120,361	352,807	308,199
Cold finished	12,607	39,415	29,977
Hoops and baling bands	14,375	36,782	44,255
TOTAL BARS	1,074,205	3,062,528	2,534,952
Tube rounds	15,015	46,430	36,224
Tool steel bars (rolled and forged)	7,389	22,538	19,468
Pipe and tube—			
Buttweld	150,685	404,706	355,738
Lapweld	73,315	204,617	216,526
Electric weld	24,174	53,283	43,159
Seamless	197,596	584,676	519,639
Conduit	9,095	25,039	24,323
Mechanical tubing	15,643	53,056	44,748
Wire rods	130,462	375,919	280,304
Wire—			
Drawn	222,753	651,250	562,734
Nails and staples	111,661	303,058	237,614
Barb, fence, bale ties, fence posts, etc.	100,158	358,847	275,220
Black plate	80,862	218,521	208,228
Tin plate	446,094	1,278,311	1,170,525
Sheets—			
Hot rolled	252,106	809,870	625,045
Hot rolled annealed	334,486	1,052,033	813,369
Galvanized	245,894	627,937	528,356
Cold rolled	267,149	1,084,193	783,609
All other	110,414	299,849	209,684
TOTAL SHEETS	1,210,049	3,873,882	2,959,863
Strip—			
Hot rolled	379,692	1,359,705	1,067,279
Cold rolled	113,560	376,766	308,834
Wheels (car rolled steel)	17,339	61,148	63,557
Axles	3,500	14,100	20,106
Track spikes	17,946	51,406	59,475
All other	2,935	7,809	7,295
TOTAL CODE STEEL PRODUCTS	6,443,449	19,444,253	16,992,199
IRON PRODUCTS			
Pig iron, ferromanganese and spiegel	913,752	2,455,214	2,430,942
Ingot molds	61,757	185,394	152,169
Plates	406	1,461	1,475
Skelp	729	2,636	2,072
Bars	10,090	31,426	35,377
Splice bars and tie plates	2,285	8,914	8,453
Pipe and tubes	9,438	26,506	33,423
Sheets	82	307	6,468
All other	2,488	7,723	8,443
TOTAL IRON PRODUCTS	25,518	78,973	95,711

Industrial Men in the News

Howard J. Kaighin, Vice President and General Manager, Standard Tube Co.

His experience in the welded tube industry extends over a period of 15 years.

Since 1926 the major portion of his time has been spent with Steel & Tubes Inc.

He has filled a number of responsible positions with this company.

HOWARD J. KAIGHIN, recently appointed vice president and general manager of the Standard Tube Co., Detroit, has been associated in the welded tube industry for more than 15 years, beginning his career as assistant superintendent of the Standard Steel Tube Co., Toledo, O.

In 1926 the Standard Steel Tube Co. was absorbed by Steel & Tubes Inc., Cleveland, and a year and a half later Mr. Kaighin was appointed superintendent. For the next eight years he was works manager of the various welded tubing plants for Steel & Tubes.

In 1928 a new plant was constructed and operated in Detroit under Mr. Kaighin's supervision, and a year later the management of Steel & Tubes sent Mr. Kaighin to Brooklyn, N. Y., to asume the responsibility of another division which shortly before had been purchased from the Mohegan Tube Co. In 1931 Mr. Kaighin was transferred to the Cleveland division, where he remained until Oct. 1 of this year, when he became associated with the Standard Tube Co.

Mr. Kaighin is interested in most forms of athletics.

• • •

Thomas W. Delanty has been appointed manager of eastern railroad sales for Joseph T. Ryerson & Son Inc., Chicago. He has been with the Ryerson company since 1918 and has been in the railroad sales division since 1925. During the war he served in the naval ordnance as chief inspector of munitions, guns, and sight mechanisms.

Mr. Delanty has had considerable experience in the machinery division. Shortly after the earthquake in China in 1923 he was sent to Japan, China, and Manchuria, and until 1925 he handled the export business there for the machinery division of the Ryerson company. Mr. Delanty is well known throughout the railroad field and has been covering the eastern territory since 1930. His headquarters will be at the Ryerson Jersey City plant.

Thomas W. Delanty

• • •

Eugene G. Grace, president, and other high officials of the Bethlehem Steel Corp., inspected the company's new Lackawanna sheet mill on Nov. 16. Mr. Grace was on his way to California.

• • •

L. A. Yoder has been appointed sales manager of the Yoder Co., Cleveland. Following graduation from the Carnegie Institute of Technology, with a degree in mechanical engineering, Mr. Yoder became associated with the Worthington Pump & Machinery Corp., Harrison, N. J. During the 11 years he was with this organization he gained extensive experience in the sale and manufacture of its products.

L. A. Yoder

In 1934 Mr. Yoder joined the staff of the Republic Rubber Co. as special representative, specializing in the application of mechanical rubber goods to manufacturers' equipment. He went with the Yoder Co. early this year.

• • •

H. C. Thomas is retiring as executive vice president of the Alan Wood Steel Co., Conshohocken, Pa., and will take up residence in California about Dec. 1. No successor has been appointed.

Mr. Thomas has long been prominently identified with the iron and steel industry, his association dating prior to 1900. One of his earlier more important positions was that of

chief chemist and metallurgist with the Alan Wood Iron & Steel Co., predecessor to the present organization. In 1908 he resigned to take a similar position with the Gary, Ind., plant of the Illinois Steel Co., and shortly thereafter was made assistant general superintendent.

After 10 years with this organization Mr. Thomas resigned to become associated with the United Alloy Steel Co., Canton, O., as general superintendent, and subsequently became vice president. After six years with this company, he returned to the Alan Wood Iron & Steel Co. to become general manager. Later he was appointed vice president in charge of operations and then president, a position he held until the company became consolidated with the Koppers Co., Pittsburgh, and W. J. Rainey Inc., New York, as the Alan Wood Steel Co. Following this consolidation, Mr. Thomas was appointed executive vice president.

While no successor to Mr. Thomas has been appointed, Ledyard Heckscher, one-time president and for many years associated with the company, has been elected chairman of the executive committee, which will be in active charge of the company.

♦ ♦ ♦

Frank V. Bush has been appointed service manager of Allegheny Steel Co., Brackenridge, Pa., succeeding M. T. Harris, recently promoted to assistant general manager.

♦ ♦ ♦

Chapin E. Harris, formerly general manager of Brown-Wales Co., Boston, is now operating independently as a general sales agent of steel products, with headquarters at 297 Dorchester avenue, Boston.

♦ ♦ ♦

C. D. Hollins, 2132 Morse avenue, Chicago, has been appointed exclusive representative of the Royer Foundry & Machine Co. in the northern part of Illinois, and Indiana, part of Michigan, and all of Wisconsin and Iowa.

♦ ♦ ♦

Robert J. Working has been appointed district sales manager for Republic Steel Corp. in the Birmingham, Ala., territory, succeeding Kenneth D. Mann who has resigned to become executive vice president of Truscon Steel Co.

Formerly in the sales department of United Alloy Steel Co. at Canton, O., Mr. Working was placed in charge of the Cincinnati district office of Central Alloy Steel Corp. in 1927. Following the Republic merger in 1930, he was made assistant district sales manager in the Cincinnati territory, being named district sales manager in 1934. Mr. Working's appointment is effective at once.

Paul R. Johnston has been named district sales manager for Republic in the Cincinnati territory, succeeding Mr. Working.

Mr. Johnston, a native of Youngstown, O., entered the employ of the Republic Iron & Steel Co. in 1922. He spent two and a half years in the sales department at Youngstown and a similar period in the Cleveland district sales office, following which he spent a year each in the Detroit and Buffalo offices. He was transferred to the Cincinnati office in 1929 at the time of the Republic Steel Corp. merger.

Robert J. Working

Charles W. East, formerly of the Birmingham office of Republic, has been named assistant manager of sales in the pipe division, succeeding George E. Clifford, recently appointed district sales manager in the Los Angeles territory.

♦ ♦ ♦

John H. Butler, formerly instructor in metallurgy and metallography at the School of Mines, Washington State college, Putnam, Wash., has joined Bennetts Chemical Laboratory, Tacoma, Wash.

Died:

JOHN R. STROH, 44, long associated with the iron and steel industry in Youngstown, O., in that city Nov. 20. Mr. Stroh was president and treasurer of the Stroh-Butler Co., merchant in silica and fire clay, which he helped organize in 1925, and was also vice president of the Pittsburgh Metallurgical Co. Inc., Niagara Falls, N. Y.

His first contact with the iron and steel industry came when he went to work for the Republic Iron & Steel Co. in its East St. Louis, Ill., plant, and later was transferred to Youngstown. Later he became connected with the Brier Hill Steel Co., and in 1919 was made manager of mining and transportation. Leaving the employ of this company when it was absorbed by the Youngstown Sheet & Tube Co., he joined the staff of the Pittsburgh Metallurgical Co.

He was prominent in the social and civic life of Youngstown.

♦ ♦ ♦

A. Edwin Batzell, 50, district sales manager for the Wyckoff Drawn Steel Co. in the Buffalo area, Nov. 17.

♦ ♦ ♦

George F. Dana, 65, president, Peerless Foundry Co., Elmwood place, Cincinnati, in that city, Nov. 19.

♦ ♦ ♦

Robert A. Mitchell, 60, chief clerk in the Pittsburgh district sales office of Carnegie-Illinois Steel Corp., in Wilkinsburg, Pa., Nov. 14.

♦ ♦ ♦

Frederick F. Newcomb, New England representative of the E. & G. Brooke Iron Co., Birdsboro, Pa., Nov. 2.

♦ ♦ ♦

Noah G. Spangler, 68, formerly general manager, Jackson Iron & Steel Co., Jackson, O., Nov. 15, in Circleville, O.

♦ ♦ ♦

Clarence W. Wiley, 65, president, Todd Seattle Dry Docks Inc., and vice president, Todd Corp., Seattle, in New York, Nov. 13, while on a business trip.

♦ ♦ ♦

Frank J. Johnson, co-founder of the American Hoist & Derrick Co., St. Paul, in that city recently. He served as secretary-treasurer from the time of the company's organization until 1922, when he became president. He resigned from that office in October, 1934.

♦ ♦ ♦

George Cameron Stone, 76, a prominent metallurgist and an authority on armor, in New York, Nov. 18. Mr. Stone had been associated with the New Jersey Zinc Co. for many years, retiring in 1930. Last February he received the James Douglas medal of the American Institute of Mining and Metallurgical Engineers. He was the author of "A Glossary of the Construction, Decoration and Use of Arms and Armor," published last January.

♦ ♦ ♦

Alfred Heber McIntire, 59, for 23 years editor and manager of *The Electric Journal*, in Pittsburgh, Nov. 4. An extensive experience with the manufacture of Corliss engines, with an electric railway company, with an electrical contractor, as well as test floor experience with both General Electric Co., and Westinghouse Electric & Mfg. Co., gave him a broad background for his editorial work. He became the first full-time editor of *The Electric Journal* in 1906, shortly after its inception, and, in 1908, was appointed editor and manager, which position he held until 1931.

EDITORIAL

Spread the Truth Concerning Machines and Unemployment!

IN MARSHALLING the essential facts regarding the relation of machinery to unemployment, employment and purchasing power, the National Industrial Conference board has provided a convincing argument against the fallacy that machines cause unemployment.

The study was undertaken by the board at the request and with the financial assistance of the National Machine Tool Builders' association. Its results now have been published in book form under the title "Machinery, Employment and Purchasing Power."

If utilized effectively, the facts presented in this study should go a long way toward breaking down the popular enmity against mechanization. If many persons in high public office could take the necessary time to digest the report, perhaps they would not be as ready in the future as in the past to infer publicly that the machine is a major factor in the depression.

Machines Are Responsible for Many Benefits; They Should Not Be Scapegoat of Depression

The report discusses causes of unemployment; the growth of population, production and employment and the attendant changes in the occupations of the gainfully employed; the growth of mechanization and its influence upon production, employment, income and purchasing power; and the peculiar aspects of unemployment during the depression period.

Three striking truths seem to stand out from this wealth of data: 1. Machinery has been responsible for important national benefits—economic and social—which often are overlooked or ignored by those who consider machines a menace. 2. The serious unemployment during the 1929-35 depression was not caused by machinery. 3. The supposition that labor-saving machinery has made such inroads upon manpower that even if production rises to 1929 levels, several millions of workers still will be unemployed—a theory fostered by President Roosevelt, Mayor LaGuardia and many others—is not supported by fact or experience.

Under the first point, the report shows that from 1879 to 1929 machinery has:

1. Created many new industries, 18 of which provided employment in 1929 for 1,123,314 workers or one-eighth of all labor in the manufacturing industries in that year.
2. Created new opportunities for employment.
3. Released workers from industries producing goods to trade and service occupations.
4. Stabilized employment by increasing the proportion of the population gainfully engaged in trade and service.
5. Made possible a large increase in the total volume of production by increasing the output per man.
6. Reduced hours of work and child labor.
7. Been the chief factor in the improvement of the purchasing power and the standard of living of the people.

Depression Unemployment Due to Low Output, Not to Replacement of Men By Machinery

As to the second point—the cause of unemployment during the depression—the report points out that the greater output per man during the lean years was due more to the fact that only the most efficient workers remained in employment and that drastic economies were practiced by management than to the effect of machinery. It concludes that "unemployment during the depression was not due to the fact that goods were being produced by machines instead of by men, but to the fact that goods were not being produced in sufficient volume."

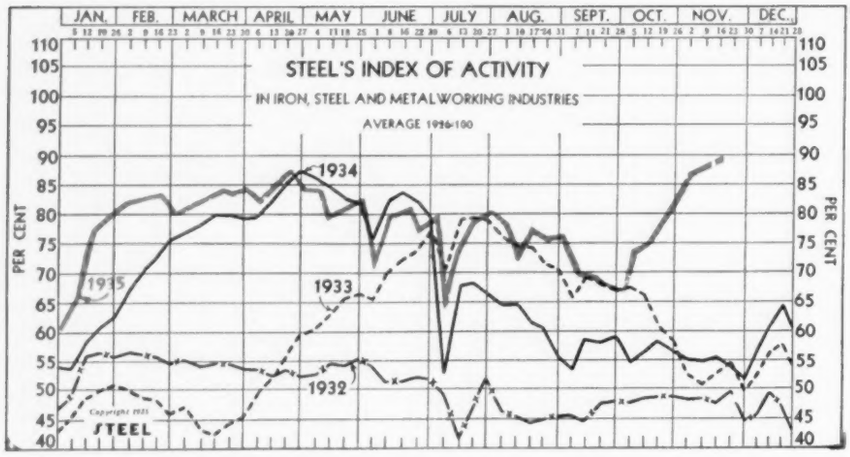
In answering the cry that the machine will keep millions permanently out of jobs, the report cites the unadjusted index numbers of the Federal Reserve board for production and employment in the manufacturing industries:

	Production	Employment
1929	100	100
1930	80	88
1931	67	73
1932	53	61
1933	64	66
1934	66	75
1935 (First half average)	74	77

These figures indicate that employment, in terms of 1929 parity, has remained above production. As production mounts and as the employers' choice of applicants narrows, the efficiency per worker will decrease. Depression economies are being relaxed, which will mean increased employment. The report concludes that the productive industries "will require as large a working force as was needed in 1929 to produce the output of 1929."

Industry should make the most of this report to convince public officials and the public in general that the machine is a constructive factor in our national development. Mechanization should be encouraged rather than retarded. The sooner government officials accept this fact, the more rapid will be the pace of recovery.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries increased 0.6 points to 89.0 in the week ending Nov. 16:*

Week ending	1935	1934	1933	1932
Aug. 31	77.3	55.1	70.3	45.4
Sept. 7	70.9	53.5	65.5	44.9
Sept. 14	70.1	58.7	69.1	47.8
Sept. 21	69.4	58.1	68.2	48.0
Sept. 28	68.5	59.3	66.9	47.7
Oct. 5	73.3	54.7	67.4	48.4
Oct. 12	74.9	56.4	66.0	48.7
Oct. 10	77.4	58.2	60.9	58.7
Oct. 26	82.4	56.3	58.0	48.3
Nov. 2	86.4	55.0	52.3	48.5
Nov. 9	88.4†	54.9	50.7	47.7
Nov. 16	89.0*	55.2	52.6	49.2

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL.) *Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.*

Record Bank Reserves May Color Industrial Outlook

ANY observer who tries to look at the favorable picture of expanding industrial activity from a broad perspective cannot ignore the factor of piled-up funds looking for profitable investment.

In recent weeks the large reservoir of domestic capital has been augmented by a steady influx of gold from Europe. The reserves of Federal Reserve banks have mounted almost to $6,000,000,000 which is practically 100 per cent in excess of requirements. This is the largest surplusage in American financial history and far exceeds the funds upon which past booms were erected.

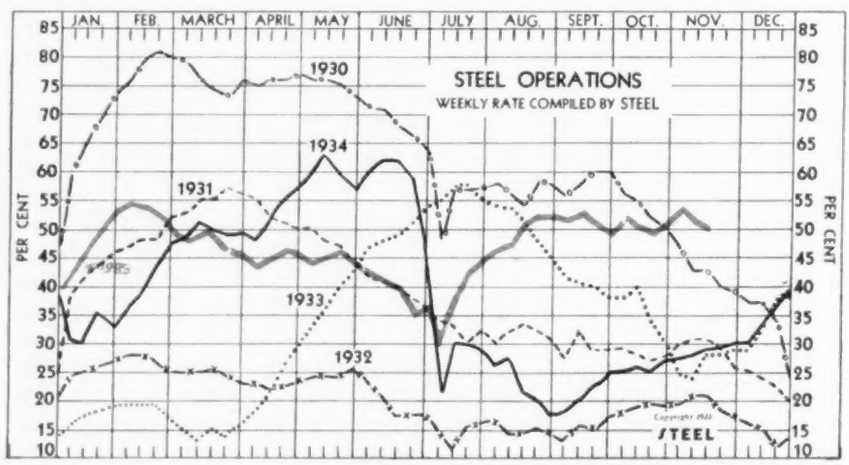
The old adage that the key to investment lies with the borrower still holds good. However, it must be remembered that the borrower acts when he has confidence that funds can be employed profitably. Waving aside the intangibles of confidence, there still remains one criterion of wisdom in borrowing. That is the ability of a concern to earn money at a good rate.

More and more companies are shifting into the status of good earners, and in this development there is hope for a *rapprochment* between finance and industry. The influence of waiting money may be an important factor in the business history of the near future.

Meanwhile industrial activity is forging ahead steadily. Thanks to a new lift in the irrepressible electric power output and to further gains in automobile assemblies, STEEL's index has mounted to a new post-depression high of 89. This figure, for the week ending Nov. 16, is the highest recorded since the week ending June 28, 1930.

In touching a new all-time high of 1,938,560,000 kilowatt-hours, electric power output surpassed the peak of 1929 by 4.2 per cent. On the basis of the improvement of the past month,

1935 Per Cent	
Nov. 16	52
Nov. 9	53
Nov. 2	54.5
Oct. 26	52.5
Oct. 19	51
Oct. 12	52
Oct. 5	53.5
Sept. 28	51
Sept. 21	52
Sept. 14	54
Sept. 7	52



1934 Per Cent	
Nov. 17	28
Nov. 10	27.5
Nov. 3	27
Oct. 27	25.5
Oct. 20	26.5
Oct. 13	25
Oct. 6	25
Sept. 29	25
Sept. 22	22.5
Sept. 15	20.5
Sept. 8	18

the output for the week ending Dec. 28 should be near the 2,000,000,000 kilowatt-hour mark.

Automobile assemblies, at 93,177 for the week ending Nov. 16, are approaching the 100,000 mark, which is believed to be the goal or stabilization level anticipated by motor car builders for the nearby future. If the industry can maintain this average for an extended period, it will be exceeding the 1926 average by about 20 per cent.

Steelworks operations, which fluctuate moderately in various producing centers and do not always remain steady throughout the week, have been tending toward a horizontal line slightly under 55 per cent. Many observers believe that the rate is destined to go higher, but whether the rise will occur before or after the year-end holidays is in doubt.

Car loadings continue to taper off seasonally. The high point in the fall of 1934 was recorded in the week of Sept. 15. This year the peak came in the week of Oct. 12, and consequently the decline to the year-end low will be of shorter duration.

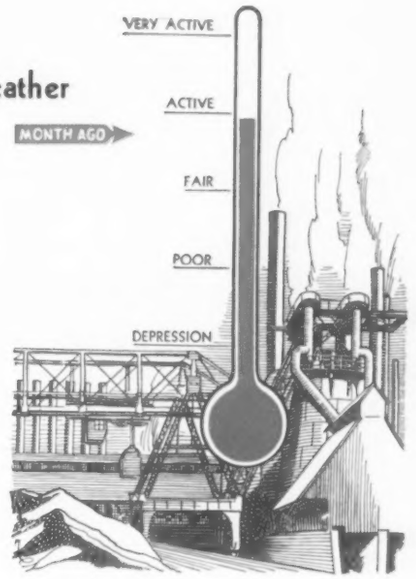
Indications of improvement in equipment orders are somewhat more promising. The gross order index of the National Machine Tool Builders' association was 185.5 for October, compared with 144.2 for September, but the 3-months moving average showed a decline. The 3-months moving average for gross orders of foundry equipment, compiled by the Foundry Equipment Manufacturers' association was 127.1 for October, against 111.8 in September.

Where Business Stands

Monthly Averages, 1934—100

	Sept., 1935	Aug., 1935	Sept., 1934
Steel Ingot Output	139.6	139.3	66.7
Pig Iron Output	145.7	134.7	69.9
Freight Movement	121.6	111.2	106.9
Building Construction	218.6	168.1	118.7
Automobile Output	89.2	39.5	56.4
Wholesale Prices	.....	109.6	99.8

Industrial Weather



TREND:

Upward

The Barometer of Business

Industrial Indicators

	Oct., 1935	Sept., 1935	Oct., 1934
Pig iron output (daily average, tons)	63,818	59,009	30,695
Machine Tool Index	102.9	108.5	40.5
Finished steel shipments (tons)	686,741	619,933	343,962
Ingot output (daily average, tons)	113,414	113,193	54,146
Dodge building awards in 37 states (sq. ft.)	27,775,900	21,365,700	15,088,400
Automobile output	*215,000	95,128	136,268
Coal output, tons	36,697,000	24,886,000	32,504,000
Business failures; number	1,097	806	1,091
Business failures; liabilities	$22,243,941	$21,837,926	$19,968,448
Cement production, bbls.	.....	7,173,000	6,675,000
Cotton consumption, bales	552,000	449,000	520,000
Car loadings (weekly av.)	720,481	657,890	632,872

*Estimated.

Foreign Trade

	Oct., 1935	Sept., 1935	Oct., 1934
Exports	.....	$195,537,000	$203,622,000
Imports	.....	$168,689	$137,859,000
Gold exports	.....	$86,000	$2,173,000
Gold imports	.....	$156,805,000	$13,010,000

Financial Indicators

	Oct., 1935	Sept., 1935	Oct., 1934
25 Industrial stocks	$186.84	$183.21	$126.47
25 Rail stocks	$26.73	$28.37	$31.08
40 Bonds	$81.18	$81.97	$75.16
Bank clearings (000 omitted)	.....	$20,979,895	$17,000,482
Commercial paper rate, New York (per cent)	¾	¾	1
*Commercial loans (000 omitted)	$7,902,000	$7,512,000	$7,807,000
Federal Reserve ratio, per cent	76.5	75.2	70.2
†Railroad earnings	$57,359,339	$42,074,108	$41,713,425
Stock sales, New York stock exchange	46,662,841	34,748,340	15,661,431
Bond sales, par value	.....	$250,189,800	$277,676,500

*Leading member banks Federal Reserve System.
†September, August and September, respectively.

Commodity Prices

	Oct., 1935	Sept., 1935	Oct., 1934	Mo. av. 1913
STEEL's composite average of 25 iron and steel prices	$32.84	$32.82	$32.10	$26.32
Bradstreet's index	.....	$10.17	$9.27	$9.21
Wheat, cash (bushel)	$1.16	$1.07	$1.12	92c
Corn, cash (bushel)	$1.08	$1.03	92c	51c
Petroleum, crude (bbl.)	98c	98c	98c	$2.50

Special Ovens Designed for Baking Various Metal Finishes

BY F. H. FABER
Despatch Oven Co.
Minneapolis

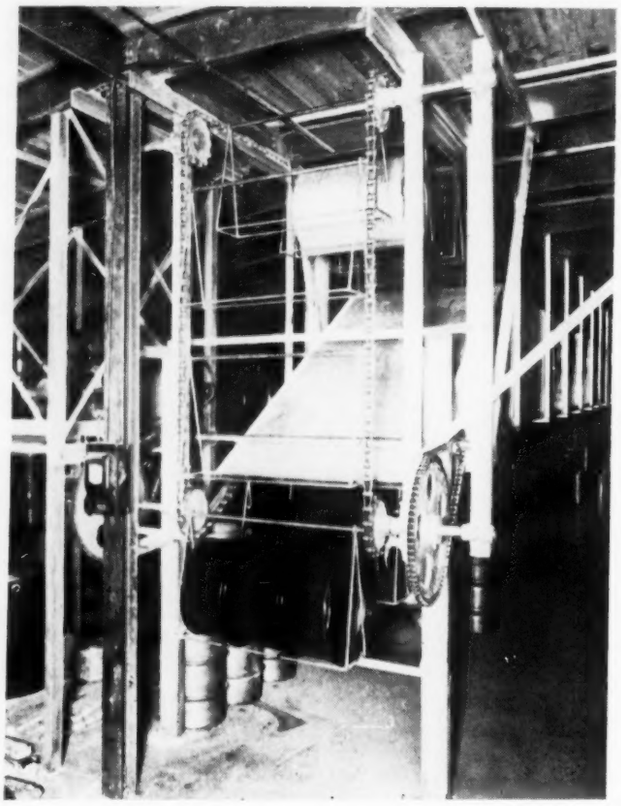


FIG. 1—A-type continuous conveyor oven for baking finish on steel barrels. Note that it is entirely suspended from the ceiling

FINISHING of metal surfaces has always been an interesting process; lately it has become even more so. The many new finishes with their varied characteristics give the manufacturer of metal products a much wider scope for selection, and practically any type of finish can be obtained easily and quickly.

Each manufacturer has a particular finishing problem. Finishes must be beautiful and attractive. They must be uniform and clean. They must be durable. They must fit into a high-speed production schedule.

Demands of Durability

There are many other factors, but, from the single standpoint of durability, consider the finish on a refrigerator, which must resist soap, vegetable and fruit juices, and other kitchen conditions.

The steel post is finished to resist the action of acid and alkaline soils, and moisture.

Dryers in beauty parlors are finished to resist the action of soaps.

Ship fixtures must resist salt solutions.

Motor finishes must withstand dirt, grit, oil, heat, acids and alkalies.

Farm implements must be finished to resist corrosion of the elements.

Motor cars are finished to resist gasoline, oil, alcohol, tar and the elements.

Oil pumps which are distributed throughout the world must withstand tropical conditions, as well as the cold, acids, alkalies, oils, salts and the elements. And so it is that each industry must find the finish which best meets service requirements.

The oven baked finish is preferred by many manufacturers. It permits a lasting attractiveness, uniformity, durability, and a definite high-speed production schedule. Widespread adoption of ovens in finishing departments bears proof of the popularity of oven baked finishes and in this connection, it may prove interesting to mention a few installations worthy of consideration in view of the remarkable results obtained.

First, consider the long A-type continuous conveyor oven, shown in Fig. 1 and located in the plant of a large steel barrel manufacturer. The barrels are sprayed and placed on carriers which move the barrels through the oven. Sometimes the temperature in the oven is as high as 350 degrees Fahr. and sometimes it is lower, depending upon the finish being applied. During the first part of the baking or drying process, the solvents and volatiles are liberated, then the film is oxidized or dried thoroughly to give a thick, durable and attractive finish. A large volume of fresh air is used in this oven.

The oven is entirely suspended from the ceiling of the building and this frees the space underneath for other operations. The rated capacity of the oven is 75 barrels per hour, but this may be increased or decreased, depending upon the particular type of finish applied to the barrels.

An external, direct-fired gas heater was furnished on this oven, thereby effecting finish baking economies.

Fig. 1 shows seals at the ends of the oven which reduce heat losses and make for a more efficient oven operation. The conveyor system permits returning the barrels to the loading end if this is desired. One operator easily can take care of this oven when it is operating at full capacity.

Finishing Grave Vaults

Grave vaults and caskets of metal are coming into fairly wide use. The finishing of grave vaults presents a little different condition, as glossy smooth finishes are not desired ordinarily, a so-called wrinkle finish being more in demand. The oven in Fig. 2 is used to process finishes on a production basis after the coating has been sprayed on the vaults. The latter are fairly heavy, weighing 400 to 600 pounds each, and they are loaded on a conveyor which is about 2 feet off the floor. The finish is baked at temperatures up to 400 degrees Fahr.

This particular oven is heated with a direct oil burner, externally mount-

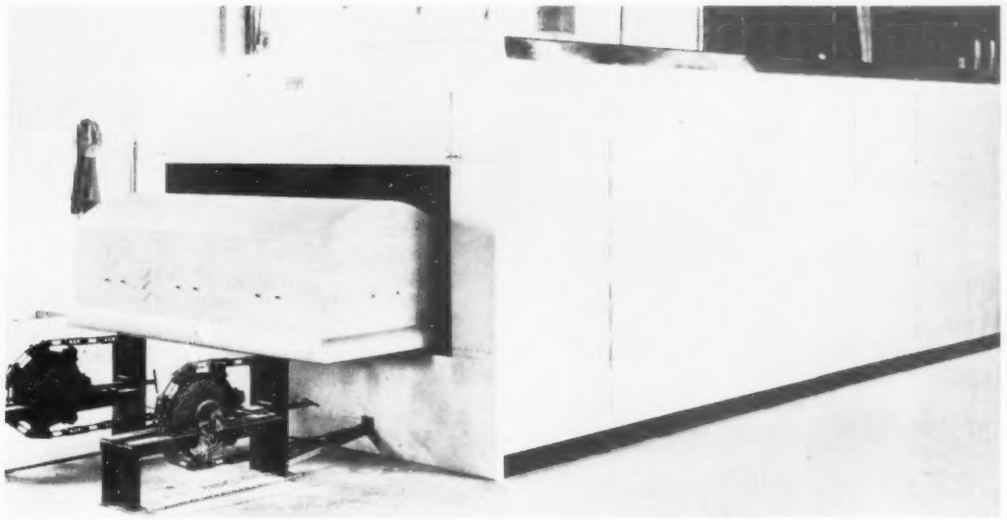


FIG. 2—Oven for processing wrinkle finish on metal grave vaults, heated with direct oil burner, externally mounted

ed, and whether light or dark finishes are processed, satisfactory results are obtained. Oil consumption is low and the cost per vault is about 2 cents.

A large midwestern motor manufacturer uses a different type of oven to meet his finish baking requirements. Floor space is at a premium. Parts to be finished are fairly small and numerous. To meet these conditions, the multipass continuous conveyor oven shown in Fig. 3 was furnished.

This oven has an automatic dipping and draining arrangement preceding the baking process. The operator needs only to place the parts on the conveyor system and the dipping, draining and baking are automatic. After processing, the parts may be taken off the conveyor system at the other end of the oven, or may be returned to the operator at the loading end. One operator with this oven can turn out a large quantity of parts, with either one or two coats as desired. The oven is heated with gas for approximately 30 cents per hour, making the cost per pound of parts processed about 0.01 cent.

Oven for Rapid Drying

Ovens may be used for shortening the drying time of other finishes. This is being done in the plant of a large eastern firm manufacturing large quantities of various products of sheet steel.

Fig. 4 shows the long tunnel oven used in this work. Corrugated sheets, 3 feet wide and 12 feet long, are processed in this oven at the rate of 12 per minute. The corrugated sheets are fed on a slat conveyor. As the sheets pass a spray station, a protective lacquer is automatically applied. Then the sheets pass through the oven where they are given a one- or two-minute dry at a temperature of approximately 160 degrees Fahr. The rate of air circulation in this oven is high because rapid drying results must be obtained to meet production requirements.

The oven is of the modern double wall nonthrough metal panel construction with thick rock wool insulation. There is an external steam heating system with automatic temperature control. The unit is flexible, as the conveyor speed may be adjusted from 38 to 160 feet per minute as required.

A brief summary of ovens for finish baking and drying would lead to these conclusions:

1. To insure the best results,

FIG. 3—Multipass continuous conveyor oven for automatic dipping, draining and baking of finish on small parts for automobiles; it is gas-fired

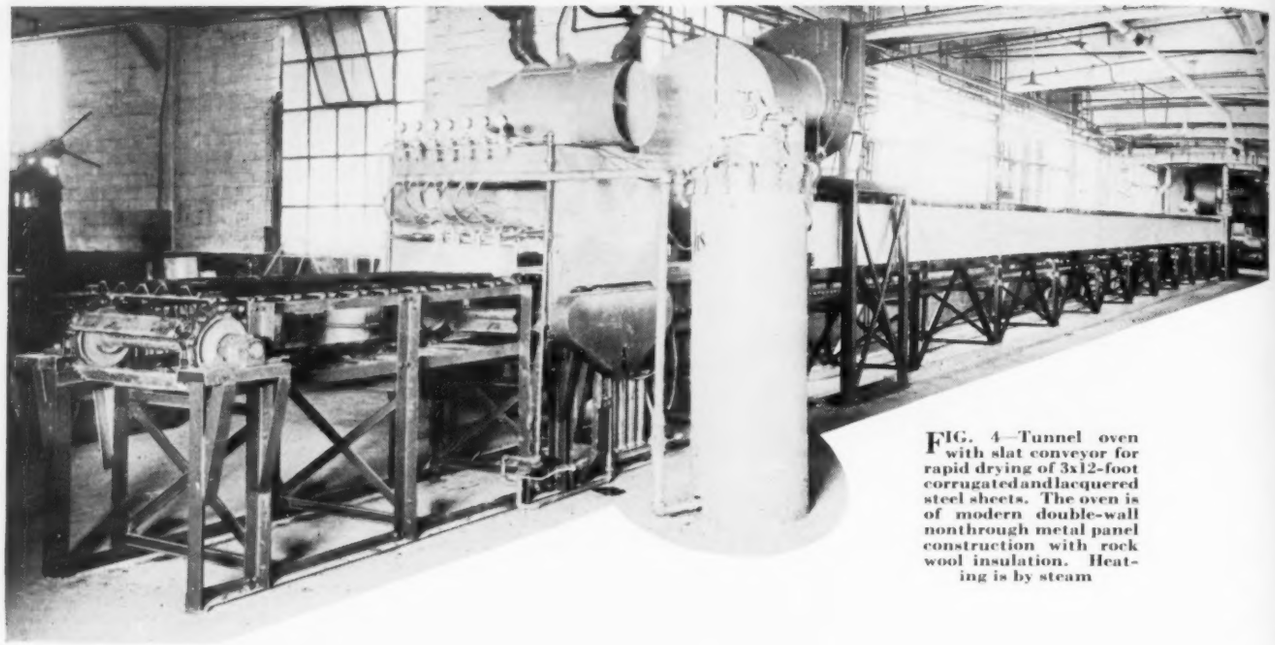


FIG. 4—Tunnel oven with slat conveyor for rapid drying of 3x12-foot corrugated and lacquered steel sheets. The oven is of modern double-wall nonthrough metal panel construction with rock wool insulation. Heating is by steam

each oven should be arranged to meet the particular operating requirements with reasonable flexibility to meet anticipated future requirements.

2. Oven design and construction must keep heat losses to a minimum, provide proper air distribution and circulation, assure maximum operating economy and safety.

3. Finish baking or drying is a scientific problem and, to be handled most efficiently, must be approached using scientific methods, preferably those used by reliable oven manufacturers. The four ovens described and illustrated in this article are manufactured by the Despatch Oven Co.

Switch Developed for Automatic Control of Rocking Furnaces

A STEP forward toward a completely automatic furnace for controlled electric melting is announced by Detroit Electric Furnace Co., Detroit. Equipment will be embodied as standard on all new models in 1936.

This improvement provides a means for automatically controlling the rocking cycle of the furnace to compensate for differences and variations in the charge.

The automatic rocking control enables the furnace operator to predetermine and repeat the rocking cycle which is most advantageous metallurgically and thermally. The correct cycle may be repeated exactly.

The roof and hearth of the furnace may be alternated on successive heats, thus equalizing the wear on the lining with a consequent lowering of lining cost. The device enables the operator to bring the furnace to full rock, automatically, in the shortest possible time so that the charge may be rapidly melted, utilizing the heat stored in the lining, as well as that directly from the arc. The new mechanism will, therefore, improve thermal economy and aid in reducing melting cost.

A distinct advantage is the fact that the rocking cycle may be recorded on the log, together with data as to composition, power input and weight. The metallurgist can add to this the resulting physical compositions obtained and the results are thereafter available for easy duplication.

Operator Is Assisted

One operator now may serve easily a battery of furnaces or, if handling one unit, is free to perform other necessary duties while not actualljy charging or pouring the furnaces.

A remote pushbutton hand control is provided to pour and reverse the furnace, giving the operator greater precision control than was heretofore available. A built-in safety limit switch prevents accidental spilling of the metal because of the furnace going past the normal safe rock in either direction (unless the operator uses the portable pushbutton control.) Remote control also saves time and labor while relining the furnace.

On the new control a set of dials is provided which determines, first, the location of the door at the time the rocking is to start; second, the initial angle of rock; third, the duration in minutes of the initial angle before the rocking angle is gradually increased; fourth, an adjustment for rapid increase or slow increase so that for bronze, for example, the furnace may come to full rock 20 minutes after it is started and for iron or alloy steel, in 50 minutes. This is especially useful since the *rate* of rocking increase can be accelerated automatically as the charge becomes more and more molten. This rocking angle increase rate is controlled by a special feed cam.

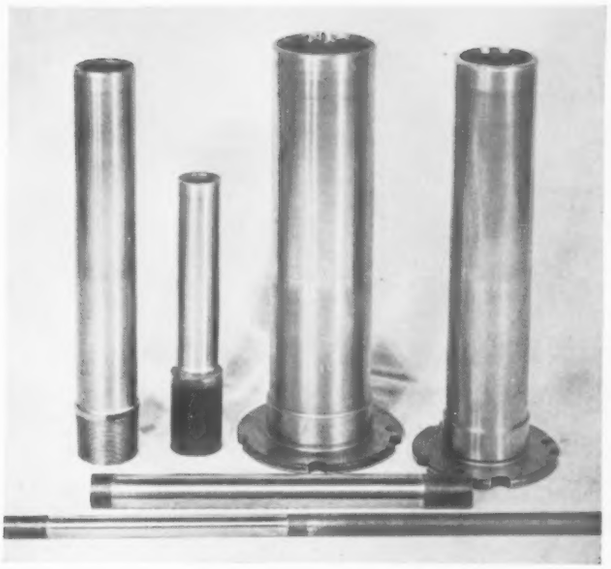
Cycle Entirely Automatic

The switch is set at the beginning of each heat and requires no further attention until the melting operation is complete. If for example, it is interrupted midway in the cycle by the operator, it will, when permitted, continue on and finish the cycle without further adjustment.

This development has been made chiefly to equip new furnaces, but has been designed so that it can be applied to practically all Detroit furnaces of the 200-pound size and upward. The switch is a development of L. V. Pittman, chief draftsman, and C. M. Weinheimer, chief engineer, of Detroit Electric Furnace.

Casting Wear-Resistant Overlays of Metallic Boron Crystals

BY MILES C. SMITH
Colmonoy Inc., Los Nietos, Calif.



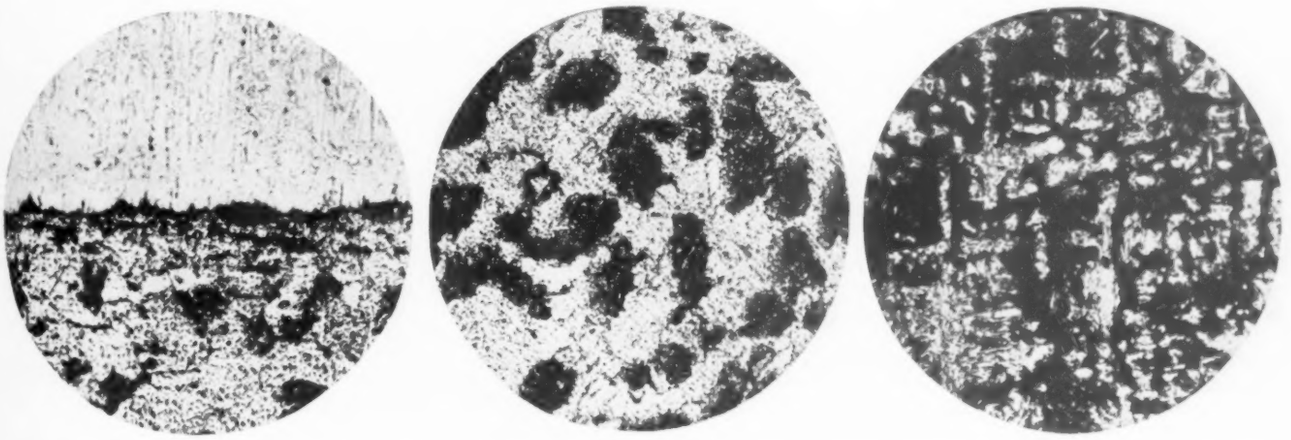
A group of overlayed sleeves and shafts which have been ground smooth. The two solid shafts in the foreground represent the most difficut pouring task of the group

TO CAST a protecting shell over or inside ferrous metal parts subjected to wear or corrosion has been a goal of metal fabricators and machine and machinery builders since it was first ascertained that certain metallic alloys could withstand severe corrosion and abrasion. But the hindrances have been many and varied. Now comes the announcement that, by utilizing a certain nickel alloy which has been impregnated with a definite percentage of newly developed metallic boron crystals, a smooth, abrasive-resistant, corrosion-resistant cast-on protection is not only possible, but surprisingly easy to obtain. Such cast-on overlays have proved to be exceptionally resistant to abrasion, have a hardness of from 58 to 60 on the Rockwell C scale, with surprising toughness, and practically impervious to the usual types of acid and alkali attack.

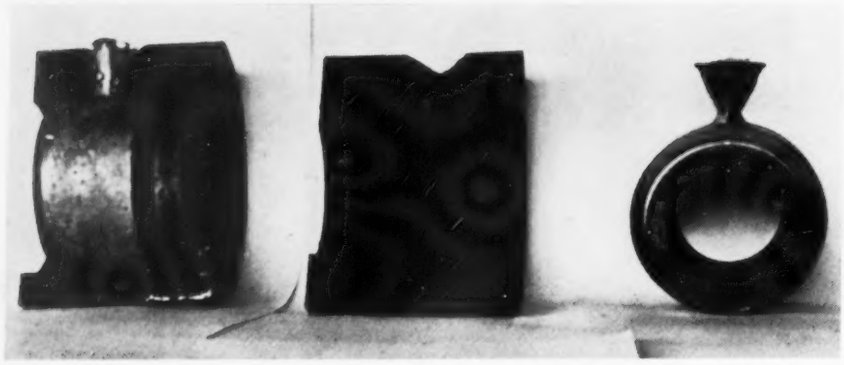
Boron and borides are not unknown. In fact, they have long been used in various branches of industry and boron carbides have been recognized as among the hardest of substances produced by man. However, the type of boron crystals that have been produced in the laboratories of Colmonoy Inc., Los Nietos, Calif., are different from any boron product heretofore developed. In the first place, these new crystals are metallic and contain no carbon, yet their melting point is so high that they cannot be fused down with the heat of the electric arc. Their hardness is but slightly below that of the diamond and well above 9 on Moh's scale. Furthermore, they are insoluble in ordinary acids, including aqua regia and a mixture of hydrofluoric and nitric acids, and they do not lose their identity when they come in contact with fused metal.

In the process of their formation, these metallic crystals form, along with themselves, a second series of crystals that can be separated from the harder ones if it is desirable to do so, which abet and assist the functioning of the harder crystals when they accompany them. This second group of crystals does go into solution with molten metal and imparts physical characteristics to that molten metal which give the cast-on overlay many of its outstanding properties. In this mixture the nickel alloy matrix for the harder metallic boron crystals is unlike nickel alloys in their native states. The alloy becomes harder, more abrasive resistant, tougher and more impervious to corrosion. Consequently, the diamond hard metallic boron crystals are held in a matrix that is of itself efficient.

Naturally, to pour on a shell that completely enshrouds a metallic part and permit it to harden from a fluid and cool requires certain precautions and preparation. The part to be processed must be preheated to varying temperatures in accordance with its



Photomicrographs showing, left to right, juncture between mild steel parent metal (bottom) and metallic boron overlay, etched in nital; structure of the parent metal etched in nital; and structure of the overlay, etched in aqua regia. All X400



An overlayed bushing and the cast iron mold used for the process. Less than 1/32-inch was allowed for grinding

shape and the character of the metal of which it is made. This new cast-on material is more or less elastic when hot and will adjust itself to a wide range of expansion and contraction but, due to the fact that it does bond tightly with the parent metal, it performs much better when it cools down and contracts simultaneously with the parent metal.

Hardness, abrasion resistance, corrosion resistance and the like, however, are not the only qualities necessary in a metal or alloy to be used to cast on an overlay. The overlay metal must bond well with any ferrous metal. It must be easy to melt and cast with a relatively smooth surface. And it must be easily repaired, should the casting prove faulty. This new metal developed by Colmonoy melts at about 2000 degrees Fahr., can be cast in a cast iron mold and has a smooth surface in its cast state. Further than that, large gates or risers are unnecessary.

Preparing Base Metal

As recommended by the developers, the procedure to follow in casting on a protective overlay is first to remove all oxide from the metal to be processed. If the parent metal is to be machined, rough machining or cutting small threads to assist in bonding is advisable. Then the part is preheated, preferably in a tube to eliminate furnace oxidation, to whatever heat is desirable in accordance with the shape of the overlay and the part to be processed.

The mold need only be a simple one. It need be no more than a cast iron shell that will permit of top pouring with no provision for extra gates or risers. When cylindrical shapes are poured, it is advisable to have the mold rest on a turntable and revolve as the molten metal is poured. For small and odd shaped parts, simple molds, such as that shown in the illustration above, suffice.

As soon as the mold has been filled, the part and its cast-on overlay should be removed and inspected. If there are any flaws, the same material in welding rod form can be used with an oxyacetylene torch to repair the defects while the metal is still hot, then the cast-on protected part is allowed to air cool.

To cast a shell about a solid shaft is much more difficult than to overlay a cylinder. The solid shaft does not offer any opportunity for contraction and, as the overlay cools and contracts, the strains set up will fracture the overlay if the shaft is of relatively large diameter. Small shafts can be overlayed by preheating them only to a bright blue and allowing the shaft and the overlay to expand together by the heat of the molten metal and then contract together.

Strains Not Excessive

Cylinders, for the most part, should be preheated to a bright red before the overlay is poured. On the whole, the cast-on metal, containing the metallic boron crystals, has a slightly higher coefficient of expansion and contraction under temperature variations than ordinary steel, but it does attempt to adjust itself to the coefficient of the metal to which it is bonded. That is, when the parent metal and the overlay are allowed to cool down and contract simultaneously, few strains are set up.

Insofar as bond is concerned, this new overlay metal actually will tin to hot and even cold ferrous metals with which it comes in contact. Any shape that can be produced in a cast iron mold may be formed, easily and quickly, and the overlay will perform efficiently, even to resisting shock as well as wear and corrosion.

Develops Detergent for Pickling Solutions

Hot rolled strip during its passage from the hot coiler to the recoiler in front of the continuous-type pickling machine is subject to considerable marking by oily gloves and oil dropping on the material from overhead cranes. The presence of oil results in scale spots being left on the finished product after pickling. This is due to the fact that the acid solution does not penetrate through the oil in time to remove the scale while the strip is in transit through the continuous pickler. To remove a few oil spots possibly no larger than 2 inches diameter has caused considerable trouble and expense in repickling long strips but they must be removed before the coils can be passed on to the cold rolling department.

Recognizing this condition the research department of the William M. Parkin Co., Pittsburgh, has developed an organic detergent which operates successfully in a sulphuric acid diluted solution at any degree of temperature or percentage of acid in the pickle bath. This cleansing compound will remove immediately all oil spots and marks from the surface of the strip so that the acid immediately can attack the scale and produce a clean surface. The product now is being used by seven stripmakers who operate continuous pickling machines.

The immediate result of the introduction of the detergent on the basis of 1 quart to 1000 pounds of acid produces a whiter, cleaner strip. The compound also can be used with success in mechanically agitated pickling equipment.

The new cast-on metal, containing metallic boron crystals, is furnished in the form of small pigs, each weighing 3/4-pound, and in welding rods of varying diameters and 12-inch lengths

POWER DRIVES

False Economy

Except in case of a smash-up or the complete failure of a drive, the cost of parts for repairs or replacements usually is much less than the labor of installing them. The value of the time the machine is out of production is generally still greater than either the repair parts or their replacement, although seldom is this item included in maintenance expense.

In spite of this, the amount of homemade makeshift parts that are used in repair work is appalling. Seldom is there any real economy, often there is a loss. For example, in an attempt to economize in one plant, brass pipe which was stocked for a special product was used in place of cored bronze bearing metal for replacing worn bearings in a clutch coupling. The absurdity was obvious when a study of the work showed that machining and installation time were the same with both metals. However, the standard bearing metal lasted about twice as long but was not twice as expensive.

Therefore, instead of saving a few cents the cost of repairs and replacement increased practically 100 per cent, as did the time out. This is only one of many instances where a good purchase became a poor bargain.

• • •

Handling Lubricants

Merely applying the proper oil or grease to a bearing, as directed by a competent lubrication engineer, is not all of lubrication. In many cases, the lubricant is contaminated before it gets to the bearing. Proper storage and handling of lubricants therefore, ranks third in importance in lubrication, next to the selection of the correct lubricant and of the most satisfactory method for its application. Neglect of any of the three points, however, may render an excellent lubricant ineffective.

Using dirty containers for handling oil from or to storage is probably one of the most common causes of such trouble and is the least necessary. This includes using the same portable container for heavy oils or greases and for light circulating oils and also leaving such containers open so that dust or moisture may settle in them.

Filling grease cups from an open can in a dusty room is simply carelessness. A good oiler will be careful. In one dusty plant, for example, the oiler is provided with extra grease cups which are filled in the dustless oil storage room and changed for the partially empty ones on the bearings. Before unscrewing the cups the connecting pipe and bearing are wiped off to prevent dust from falling into the opening.

Modern dustproof storage and dispensing equipment is as necessary in the industrial plant as in the filling station. In selecting the location for lubricant storage and dispensing rooms, consider freedom from dust and high temperatures, and a central or convenient location.

A little care, cleanliness and good housekeeping in handling lubricants costs practically nothing; carelessness and neglect in handling or applying, however, can render the best and most expensive lubricant ineffective and cause serious bearing trouble.

• • •

Temporary vs. Permanent

One of the most common errors in judgment in the average industrial plant is on what are temporary and what are permanent installations. In more active and progressive factories it is not uncommon for a so-called permanent installation to be removed or entirely revamped within a year or so. Conversely, in many other plants installations considered as temporary are retained and used for years.

Particularly is this true in connection with drives. No doubt one of the chief reasons for this is a lack of appreciation of the importance of the drive. Usually the drive is planned last. As soon as the new work has received the approval of the higher executives every effort is made to rush the installation into operation. If a few drive details are incomplete, or not available, then "put anything in to get going. If we have to, we can change it later."

Altogether too often the changeover is delayed unless a breakdown or failure necessitates radical changes. As long as the drive operates, and it is a poor drive that does not, even though inefficiently, it is permitted to go along piling up the extra maintenance and power expenses and continuing the losses in production.

In addition, temporary installations are often poorly wired with exposed leads, which, although perhaps safe, detract from appearance. Also, workmen have a tendency to be less considerate of the temporary.

Plant engineers in many progressive plants advocate considering all installations as permanent and do not tolerate makeshift wiring or other unsightly connections. One advantage in purchasing unit driven equipment has been that the drive is planned and all preparations made by the manufacturer for quick and permanent installation, thus satisfactory operation is assured. However, the same amount of engineering and thought devoted to the drive as is given to the remainder of the installation will also assure satisfactory operation of group driven equipment.

• • •

Backstops

Backstops prevent accidents from backward rotation on heavily loaded vertical and steeply inclined elevators and conveyors in case the drive should be stopped while the equipment is loaded or the motive power is shut off for any reason.

A common type of backstop is known as the differential brake band type, which consists of a brake band riding lightly over a wheel mounted on a shaft in some part of the drive. Slight reverse motion of the shaft quietly sets the brake through an eccentric cam acting on the brake band.

Since the coupling must be designed to meet the torque load, mounting the brake on the motor shaft between the flexible coupling to the speed reducer and the motor permits using the smallest size of brake. A protective, dusttight housing is used in abrasive atmospheres.

• • •

What would 5 per cent of your annual power bill amount to? Most plants can easily save that much and often an equal amount in maintenance expenses by redesigning some of their drives. Is that 5 per cent worth looking after?

• • •

One plan which helps prevent trouble is to use automatic lubricators on clutch sleeves and loose pulleys, unless they are provided with antifriction bearings.

• • •

When a plant buys its power, more attention generally is directed toward eliminating power wastes.

• • •

It is not what a lubricant costs to buy but what it saves when used properly that counts.

METHODS AND MATERIALS

Hydrogen Purified Iron Has Changed Properties

A study of hydrogen-purified iron at the Bell Telephone Laboratories, New York, offers some interesting information. The iron ring, magnified as shown in the accompanying illustration, shows the large crystal grains characteristically produced by high-temperature treatment in hydrogen. Iron so treated has properties that are very different from those of ordinary annealed iron; particularly a high magnetic permeability and low hysteresis loss.

It has been suggested that the coarsened crystal structure might account for this change in properties, but evidence accumulated at the laboratories tends to show that the change is rather the result of the removal of microscopic impurities.

S S S

A Good Steel for Springs Used in High Temperatures

A steel originally developed as a shock resisting tool steel now is giving excellent service in the form of springs operating at temperatures between 500 and 1000 degrees Fahr. These springs are utilized in valves, meters, and similar products which are used in connection with steam and other high temperature applications. The steel contains 0.45 per cent carbon, 1.75 tungsten, 1.50 chromium, 0.25 vanadium and 0.30 silicon.

S S S

Oxyacetylene Cutting of High Chromium Steels

It may seem incongruous to speak of using oxygen for cutting oxidation-resistant steel, however, this operation can be performed quite satisfactorily. An accepted method of oxyacetylene cutting of chromium-nickel steel is that developed for riser cutting. An injector type cutting blowpipe is used with extra heat and a slightly carbonizing flame.

Stainless steel plate often is cut by the flux method, which consists in clamping soft steel plates on either side of the work to provide enough iron oxide and molten iron to flux away the more infusible chromium and nickel oxides. This may be accomplished also by holding an iron rod in the cut to provide fluxing material.

Naturally, these methods take more heat than is used in cutting ordinary steel and the heating effect on the stainless steel is apt to render

HIGH-temperature treatment of this iron ring in hydrogen produced high magnetic permeability and low hysteresis loss

Seeks Fabricator for Nonslip Open-End Wrench

MANUFACTURERS, with steel stamping and power press equipment, may be interested in investigating possibilities of a new patented nonslip open-end wrench, manufacturing license for which is about to be granted by Albert Freedman, 133 Greene street, New York, representative of the inventors.

The wrench, shown herewith, can be used as an ordinary open-end wrench; when the mechanic is ready to give the nut a final turn, he simply presses the

button on the handle forward, thereby locking the wrench to the nut and eliminating the danger of accidentally disengaging the wrench. It is claimed that the wrench, when locked, provides a firm grip on the six sides of a hexagon nut and it is impossible to pull the wrench away from the nut.

The tool comprises five stamped parts, and is said to be especially suitable for work that requires accurate adustment, and particularly handy when nuts must be tightened at odd angles. Interested manufacturers should communicate with Mr. Freedman at the above address.

it susceptible to intergranular corrosion, unless the steel contains a stabilizing element. Columbium and titanium counteract the harmful effects and eliminate the need of heat treatment after the cutting operations have been performed.

\$ \$ \$

High-Tensile Alloy Steels Specified for New Dredge

Fabricators of the recently developed high-tensile alloy steel which manufacturing subsidiaries of the United States Steel Corp. are marketing under the name of Cor-Ten have found that for certain uses the steel must be galvanized. It is reported that hot dip galvanizing can be effected satisfactorily and that in numerous instances such coating is being done.

\$ \$ \$

Welded Drop Pit Table for Locomotive Shops Built

A special-purpose electrically operated machine known as a drop pit table, which when installed at division point back shops or roundhouses, permits the economical maintenance of locomotives at these points rather than at the large main shops, is constructed entirely by arc welding by the Shaw Box Crane & Hoist Co. Inc., division of Manning, Maxwell & Moore Inc., Muskegon, Mich.

The new welded unit, shown in an accompanying illustration, is built in both movable and stationary types for removing and replacing locomotive driving wheel sets, engine and trailer trucks.

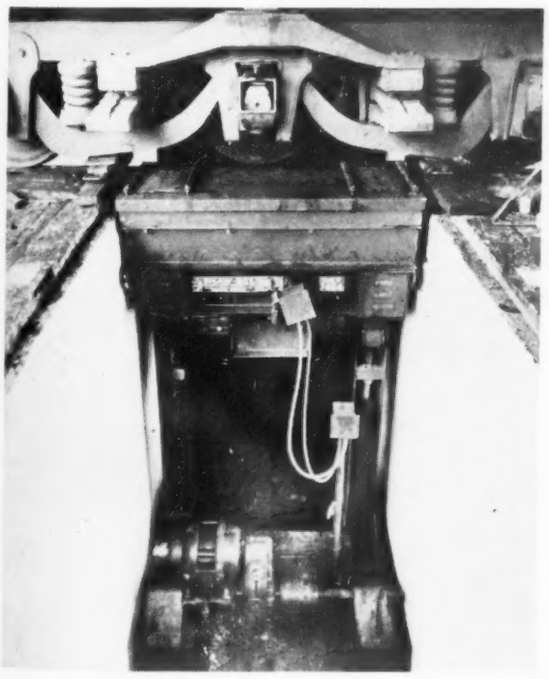
Three independent units make up the complete table—the truck, lifting table and table top. The lifting table is raised and lowered between rigid steel columns, mounted on the truck, by four drums and four flat steel flexible cables. The drums are operated simultaneously by one motor through two duplicate gear drives contained in the table. Hence, an equal pull is applied at each corner of the table. The columns support and guide the table. The table top is detachable and is equipped with locking bars and sections of rails to form a continuous track over the pit when locked in position.

The exclusive feature of the design of this drop pit table is the use of four flexible cables and winding drums for raising the load, rather than the former practice of using jackscrews.

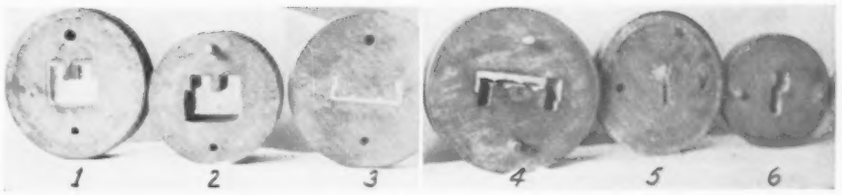
The unit is supported by four standard H-columns carried on and welded to a base of two H-columns welded intergral with cross connecting members. Additional stiffness is provided the vertical columns by steel gusset plates welded to them and to the base. The lifting table is also fabricated by welding a number of separate parts including channels, H-columns, plate, angles and the like into a single piece. Welding was done with shielded arc equipment supplied by the Lincoln Electric Co., Cleveland.

The table is moved along its track on four wheels driven by gearing connected with an electric motor mounted on the base of the unit.

The use of arc welding in construction is reported to save approximately 15 per cent in weight.



WELDED steel shapes feature the design of this drop pit table recently developed for locomotive maintenance work



Brass extruding dies, Nos. 2, 4 and 6, are cut with an oxyacetylene torch to a tolerance of 3/32-inch compared with their corresponding follower dies and are used without machining. The follower dies, Nos. 1, 3 and 5 are torch cut and machined or ground

\$ \$ \$

Brass Extruding Dies Cut By Oxyacetylene Flame

The two illustrations above show three sets of steel dies for the production of extruded brass shapes used largely in the architectural field. They recently were cut from low carbon steel plate 3½ inches thick. The dies are in pairs, Nos. 1 and 2, 3 and 4, and 5 and 6. No. 1 die is the follower die for No. 2; No. 3 for No. 4 and No. 5 for No. 6.

The dies are cut to a tolerance of 3/32-inch compared with their corresponding follower dies and are used without machining; thus the dimensions of the dies are 3/32-inch more than those of the follower dies. The follower dies are torch cut and machined or ground to exact dimensions. Cutting was done on an oxyacetylene machine furnished by Air Reduction Sales Co.

The dies are used in a hydraulic extruding machine. Heated brass ingots are placed behind the hydraulic piston and the metal is forced through the dies, first through the roughing and then through the follower die.

\$ \$ \$

Devises Portable Quench Tank for Laboratory Use

To simplify the heat treating of small metal parts in its heat treating laboratory, an eastern company makes use of a portable quench tank. This tank, devised by the company's engineers, is heated by two thermostatically controlled electric immersion units, thus the temperature of

the bath is constantly under accurate control.

A flexible cable connects the tank to a conveniently placed wall outlet so that the unit may be wheeled in front of any furnace in the laboratory. This insures immediate quenching from all furnaces without the added expense of a quench tank for each furnace. The company is said to be entirely satisfied with the operation of the tank.

United States Leading the World in Exhausting Its Mineral Resources

LITERALLY digging itself into its natural environment on a scale which has no precedent in history, the United States is leading the world in the speed with which it is exploiting and exhausting its natural resources.

Such is the contention made by Dr. C. K. Leith, professor of geology, University of Wisconsin, Madison, Wis., in an article on "Conservation of Minerals" published in a recent issue of *Science* magazine. Prof. Leith is vice chairman of the federal government's planning committee for mineral policy, which during the past year or so has tackled America's complex problems of mineral conservation.

Pointing out that for metals and fuels, despite a magnificent endowment, depletion is further advanced than even mining men generally realize, Prof. Leith asserts that "the speed of our attack on mineral resources is indicated generally by the fact that the amount produced since the opening of the century far surpasses the total of all preceding history of the United States."

Iron Ore for 40 Years

In terms of years of measured reserves of present commercial grades the United States has supplies of oil, zinc, and lead for from 15 to 20 years, he maintains. Its copper supply is good for about 40 years. The total for iron ore, including its lower grades, is good for hundreds of years, but the known reserves of high-grade Mesabi ores now supplying about half of our requirements will last about 40 years, and for the rest of the Lake Superior region, supplying about 30 per cent of our requirements, the figure is less than 20 years. Coal reserves of all kinds, high and low grade, favorably and unfavorably located, will last 4000 years, but the kinds we are now using in favorable location are measured in a century or two.

"Further discovery and the use of lower grade resources will extend the life of most of these resources, but the range of possibilities is now pretty well understood, and with maximum allowance for such extensions, the figures are sufficiently small, when compared with what we hope to be the life of the nation, as to be matters of public concern," Dr. Leith declares.

Such depletion of mineral reserves has been accompanied by huge losses of mineral wealth, some avoidable and some unavoidable, he points out, explaining that the principal wastes are not due to lack of advancement in technological and scientific methods but to maladjustments in the economic and political conditions under which the industries are operating.

As a means of accomplishing greater conservation of mineral resources, Prof. Leith suggests in his article several plans drawn up by the planning committee for mineral policy. These plans are designed to make possible the balancing of supply and demand in mineral resources in the interest of conservation which, he asserts, "is the problem that is now squarely before us."

For the Microscope

SURFACE illuminator for microscopes, introduced by Bausch & Lomb Optical Co., Rochester, N. Y., provides a well balanced annular cone of light which can be varied both in intensity and incident angle. The unit comprises an annular ring holding six 2.5-volt bulbs equally spaced around the inside of the ring, with individual reflecting surfaces back of each bulb. The ring slips on over the microscope objective and is held in position by an extension rod suspended from a clamp attached to the eyepiece adapter. The illuminator can be used only with the 48, 32 and 16-millimeter microscope objectives. Transformer with variable resistance and switch for 110-volt, 50 or 60 cycle alternating current is supplied

Introduces Two Products Made of Plastic Material

Two new products made of plastic material are announced by the Bakelite Corp., New York. One of these, known as Bakelite-Rogers board, consists of pulp and fibrous products treated with Bakelite resinoid. It is manufactured by Bakelite-Rogers Co, Inc., an affiliate of the Bakelite Corp.

This material may be molded into some shapes and approaches Bakelite laminated in its mechanical strength. Articles such as refrigerator breaker strips, saw handles, knobs, molded trays, baseboards and trim, textile bobbins and spools, are examples of products fabricated from this new material.

The other new product is a line of resin-rubber combinations employed for the manufacture of brake linings, clutch facings and similar products. By producing sections consisting of asbestos filled material bonded with a combination of two parts rubber and one part of Bakelite resin, the heat resistance of this new product has been greatly increased. The thermoplasticity at high temperatures, such as 400 degrees Fahr., has been greatly minimized. There is a distinct improvement in wear resistance at high temperatures.

Heat Resisting Rolls Are Cast Centrifugally

Constantly rising standards of finish required on steel sheets and other advances in the art of steel production have led to marked changes in the design of heat-resistant alloy rolls used in normalizing furnaces. These rolls are cast on a newly completed centrifugal casting machine designed by metallurgists of the Michiana Products Corp., Michigan City, Ind. The method produces rolls of superior surface which will not scar the steel sheet. The strength and serviceability of the rolls also are increased by this method of casting since uniform structure is assured.

A new patented method is used to attach the trunnions to the barrel. They are cast funnel-shaped at the joining end, that end being of a diameter to fit closely inside the roll which is hollow. The ends of the roll

are slit for swaging over the end of the trunnion. After swaging the segments of the roll are electric welded together and to the trunnion making an exceptionally strong and rigid construction.

Canadian Company Licensed To Produce New Gearing

Canadian manufacturing and distribution rights on cone area-contact gearing, recently put on a production basis by the Michigan Tool Co., Detroit, which developed manufacturing methods and equipment, have been assigned to the Dominion Engineering Works Ltd., Montreal. The new type of gearing features greater tooth contact area and resultant low unit pressures, long life and high efficiency. This gearing and its method of manufacture were described in the Sept. 23 issue of STEEL.

Cone area contact worm gearing not only will be used by the Dominion company in its own products but will be engineered and produced by this company to meet general demand in Canada. Products of the Dominion company include gear-type couplings; speed reducers; and gear motors; mining, rolling mill and paper making machinery; hydraulic turbines; and electric-steam generators. Expansion of manufacturing facilities already is under way and equipment is being installed as rapidly as possible for production of the new gears.

Organizes Committee To Study Gaseous Fuels

Acceding to numerous insistent requests, the American Society for Testing Materials has organized a standing committee to undertake certain standardization and research work in the field of gaseous fuels. The main subjects selected for immediate development are collection of samples, measurement of samples, calorific value, and specific gravity or density.

Officers of the committee are: Chairman, A. C. Fieldner, chief engineer, experiment stations division, United States bureau of mines, Washington; vice chairman, R. B. Harper, vice president, Peoples Gas Light & Coke Co., Chicago; and secretary, R. M. Conner, director, American Gas Association Testing Laboratory, Cleveland. The advisory committee consists of Dr. G. G. Brown, professor of chemical engineering, University of Michigan, Ann Arbor, Mich.; J. V. Freeman, technical assistant, United States Steel Corp., New York; and G. G. Oberfell, vice president in charge of research, Phillips Petroleum Co., Bartlesville, Okla.

WELDING, et cetera . . .

BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Slight Problem

MR. ROOSEVELT'S problem of how a man could disappear completely and take $5,000,000 with him is being worked on by writers and psychologists in a series of articles in *Liberty*. So far, nothing has been suggested as complicated as situations arising in real life. Here is one that the experts might work on:

Several salesmen were waiting in the lobby of an office building to see a purchasing agent who was about to let a contract for a considerable tonnage of steel. While the attendant was away for a moment another salesman came in. He was somewhat flustrated to find his competitors there ahead of him. When the attendant returned, he asked the newcomer for his card. The salesman whisked out his bill fold and handed the attendant a card which was promptly taken in to the purchasing agent.

A Question of Cards

Within a few minutes the purchasing agent, whom the salesman had not previously met, sent for him. After a few preliminaries, the purchasing agent informed the salesman that his company had made the best proposal and would be awarded the contract and he was handed a formal purchase order. The salesman thanked the purchasing agent and left. When he got back to his office, he found that the order had been made out to his principal competitor. The price and terms were less favorable to the purchaser than his firm was prepared to make.

On reflection, he recalled that he had met a salesman representing his competitor in another district on a train in the last few days and that they had exchanged cards. The competitor's card was missing from his bill fold. He had evidently sent in his competitor's card.

The question he had to answer was how to get that order transferred to his company's books. After the psychologists solve Mr. Roosevelt's problem, they might try this one.

Warpage

The principles of the methods used to control warping of welded structures are simple. Welds always get shorter in all three dimensions. Maximum warping occurs along the longest dimension of the weld if the structure is free to move.

If possible, break the structure up into subassemblies, weld subassemblies and allow them to cool. Compensate for warping when subassemblies are welded together to make the complete structure. Weld metal applied in thin layers may be peened and most of the warping removed. All warping may be removed by applying weld metal in thin layers and peening both weld metal and adjacent parent metal.

Sparks and Flashes

A York, Pa., manufacturer cleans out his old iron foundry and turns it into a shop for making welded steel construction. A Detroit automobile manufacturer shut down several forging plants when he changed to a cast crankshaft. Technical progress produces movement, stimulates change.

* * *

A plant which makes automobile frames built several million dollars worth of automatic equipment to handle the material and drive the rivets. Its competitor is now running night and day building automobile frames which are largely welded. Strength and absence of body squeaks in service are the reasons for welding.

How Do Modern Manufacturing Methods Affect Industrial Efficiency?

BY H. A. MOORE
General Sales Manager, Foster Machine Co.,
Elkhart, Ind.

VALUE of an investment, whether in government bonds or in factory equipment, is the profit or return from the investment. In the case of bonds, it is interest; in the case of manufacturing equipment, finished parts. Bonds provide a fixed return, while new factory equipment requires more thought and study to appreciate the return from the investment.

How often do we find concerns investing in bonds, when the same investment in their manufacturing departments would result in much greater returns. Does this not infer a missing link between the production, appropriation and financial departments? We see the department that must O.K. expenditures for new equipment accept, as a standard of production efficiency, the demands of the immediate situations—the "get by" or "make it do" policy—and, in so doing, accept false and expensive limitations of achievement.

Good Business but Losing Money

A short time ago the writer called on a fairly large, well established manufacturing plant with one of our representatives. This plant was busy, operating two 8-hour shifts of about 200 men each. In order to interview the general superintendent, it was necessary to call in the evening and, while waiting for our appointment, we were invited into the factory by the president who had returned that evening to look over the night force.

After our trip through the plant we returned to his office and discussed business conditions in general. But, there seemed to be something on his mind he wanted to unload and, directing conversation to his own factory conditions, he eventually informed us they were unusually busy and were having trouble meeting the demands for their goods, but that they were losing money, which you can readily appreciate was disturbing to him.

Old Equipment Inefficient

There was not a machine in his plant less than ten years old, and many of the machines were badly in need of repair. Modern machinery could have accomplished better results in an average of about one-third the time. The proportion of obsolete equipment in his plant, compared with the average in plants manufacturing this same line, made it impossible for him to produce at a cost that resulted in a profit, at the selling prices which were established by competitors who were using modern and more productive equipment.

In acknowledging these conditions, he informed us they were not in a position to purchase new equipment, and yet many pieces of new equipment could be placed in his plant, which would pay for themselves in at least a year and a half. How could he continue to do business at a loss and ever expect to accumulate the necessary funds to purchase new equipment?

It was further interesting to learn that this concern became established in its present line some years ago after a depression, by establishing lower selling prices, for the reason the plant equipment, at that time, was newer and more productive than that of older established concerns.

This is only one of many such concerns floundering around in a sea of obsolete equipment, hopelessly expecting some miraculous turn of events to take place which will again put them on more even footing with more progressive competitors.

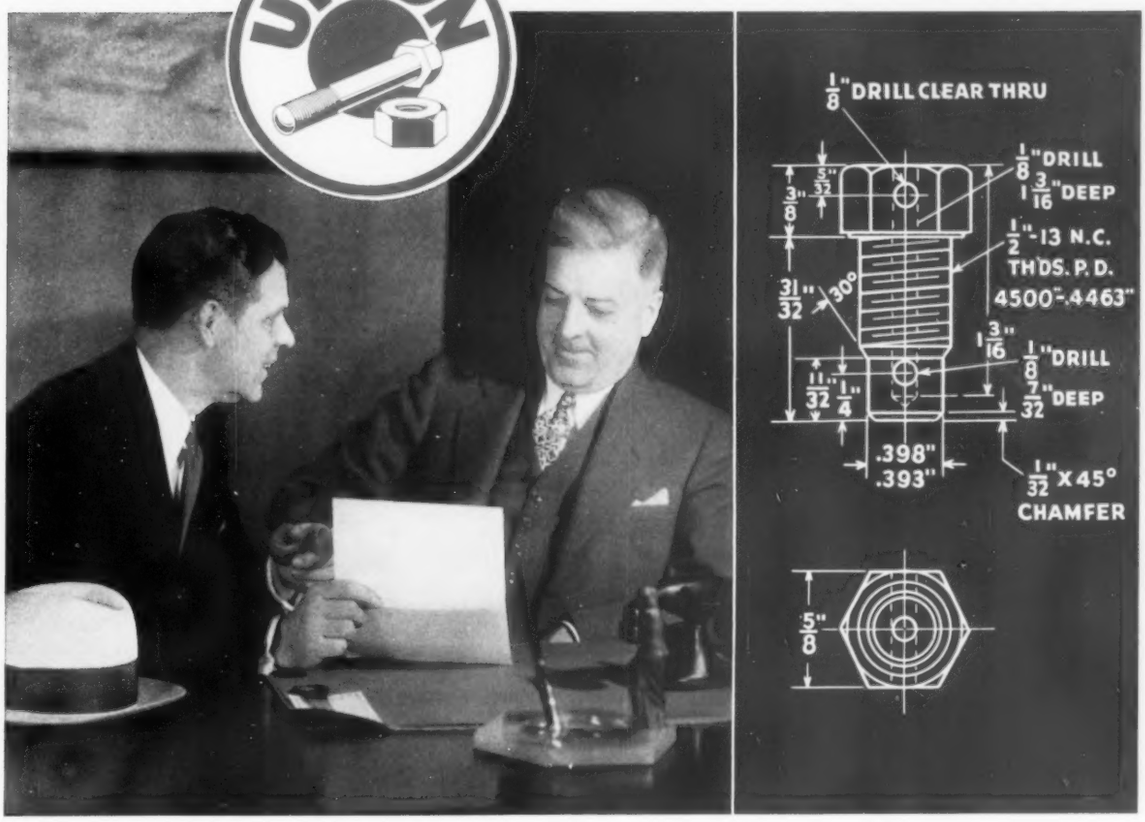
The future holds promise only for the fittest. These are new times; different and better manufacturing methods must be employed in order to keep pace with these new superproduction demands. The first requirement of fitness is economy of operation by employment of proper men, equipment and methods.

Production Rate Is Increased

Our company recently installed an automatic chucking machine in a nationally known plant. Production by the old method was five pieces in 8 hours. With new equipment a piece is completed every 20 minutes and the operator is handling two machines, while with the old method he handled only one machine.

Equipment engineers were at first skeptical of the new equipment performing as recommended. They had determined on what they would consider a maximum, or satisfactory production to justify the expenditure for new equipment, and when we presented our time estimates, they informed us they thought we had overlooked some of the difficulties formerly experienced in machining these particular parts and, in presenting the saving to be made with the new equipment to the appropriation department, they increased our estimated times about double. However, today they are producing these parts in less time than we had estimated.

We have another installation of three automatic machines, all under the care of one operator, which are producing about one-third more than had previously been produced with three hand-operated machines requiring three operators. But that is not all; assembly and run-in time is about one-half of what it was when the old machines were in use.



"That's how *Upson* can save you money"

During the last few years, many manufacturers of various types of products have stopped manufacturing in their own plants special headed and threaded parts used in assembly. They found it more economical to buy from Upson. They found that Upson quality did not vary. They could purchase to meet visible requirements without expanding plant operations, increasing payrolls and power costs.

With increasing business, many of these buyers will continue to obtain parts from Upson—because experience has proved that Upson specializes in headed and threaded items.

Upson can take your specifications, outline a production plan, and fabricate more economically than most manufacturers. Here bigness, experience and craftsmanship combine to spell economy for you.

So send in your drawings and let our quotations surprise you pleasantly.

UPSON NUT DIVISION · · · CLEVELAND, OHIO

Republic Steel

CORPORATION

GENERAL OFFICES · · · YOUNGSTOWN, OHIO

LARGE USES OF STEEL IN SMALL WAYS

300th Article ◆ Car Movers

CAR movers are among the indispensable units at manufacturing plants where incoming and outgoing materials and products are handled directly in railroad cars. Because of the engineering principles incorporated in their design and the materials used in their construction, these units permit multiplication of a man's strength to an extent which permits him to move a loaded or unloaded car along the rails.

One of these units, shown in the accompanying illustration, weighs 18 pounds complete. The handle, of second growth Wisconsin maple, weighs 6 pounds and the mover itself 12 pounds; and yet this light unit easily will move a locomotive. It accomplishes this by the utilization of triple compound leverage. Too, it is of the roller type, providing greater power, and permitting easy operation with minimum slack, rapid action and minimum wear.

Suitable for Heavy Duty

Other features reflect improved design. The spur is concave and set at an angle to give greater track gripping power. The spur plate is so constructed as to eliminate wear on the shoe. The saddle toggle and connection are so arranged that both the nose of shoe and saddle toggle operate as a single unit. It is intended to meet the requirements incidental to heavier car loading. When parts become worn they may be replaced.

—Advance Car-Mover Co., Appleton, Wis.

Weighing only 18 pounds, this device permits moving heavy railroad cars, and even locomotives, on plant sidings

Shoe, socket and saddle toggle are electric furnace, normalized steel castings containing 0.25 to 0.35 per cent carbon, 0.60 to 0.80 manganese and lower than 0.04 in both phosphorus and sulphur. These castings are produced from hot metal obtained by melting steel bars. Average physical properties of bars melted in 10 consecutive heats were 77,355 pounds per square inch tensile strength, 43,257 pounds per square inch yield point, 25.95 per cent elongation and 38.09 per cent reduction of area.

The spur plate is of malleable iron. There are two bolts and nuts which are of mild steel. The pin which fastens the roller and toggle to the shoe is ½-inch and of hot-rolled mild steel. The roller itself is a steel bushing. The two steel spurs, each ½ x ½ x 1¼ inches, are of tool steel.

Oil-less Bearings Now Used On Heavy Duty Work

Metalined bronze oil-less bearings, manufactured by the R. W. Rhoades Metaline Co. Inc., Long Island City, N. Y., because of improvements in the effectiveness of the self-lubricating principle, now are being used to an increasing extent on heavy duty applications where sturdy bearings are required. These bearings are now made in the split type, either with or without flange, and also in the one piece type, either with or without flange, in sizes from ⅜-inch inside diameter and ¾-inch outside diameter to 18 inches inside diameter and 19 inches outside diameter. Bearings of this type are employed where the use of oil or grease is impractical, where the bearings run in high temperatures, where they are submerged in water and where the design of the machine makes them inaccessible. There are several grades of these bearings to take care of a multitude of bearing requirements.

Stainless Steel River Bed

In constructing a new reservoir near Sheffield, England, engineers demolished an old weir on the River Derwent and built a measuring channel in its place. This channel is unique in that its masonry bed is covered with stainless steel sheet. The purpose of the stainless lining is to prevent the growth of a moss and other vegetation which would choke the flow and induce errors in the measurements.

WITH this issue, STEEL *presents the 300th installment of its series of articles under the heading "Large Uses of Steel in Small Ways." This series was started by* STEEL's *predecessor,* Iron Trade Review, *Nov. 22, 1923, the first article discussing the use of steel in corsets. At that time it was estimated over 100 tons of steel per day was being consumed in the manufacture of corsets —a figure which the emancipation of women has in recent years reduced to a fraction of this amount.*

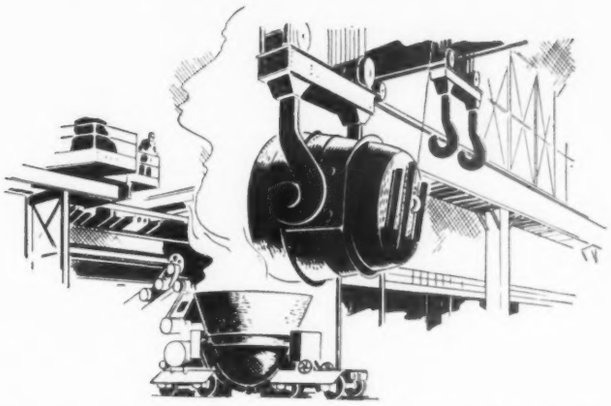
The articles have appeared over the past 12 years, weekly for a time, then every other week, presenting information on innumerable well-known and obscure uses of steel. In 1926, 51 of the articles were assembled into book form and proved unusually popular. In 1931, a second volume was published, containing 93 more articles in the series. This volume, likewise, was a best seller.

It is interesting to look back over the many varied subjects analyzed in this series. A few of them: Bird cages, eyeglass cases, needles, paper clips, radio towers, steel vests, surgical instruments, watch hands, artificial limbs, bottle caps, cork screws, pianos, pistols, sap spouts, shoe cleats, welding rods, wrenches, miniature golf courses, harness chains, ice tongs, etc. STEEL *will be glad to send to anyone desiring it a complete listing of all subjects covered, together with date of publication.*

New and interesting uses of steel, in both large and small ways, are being developed daily, and are being described regularly throughout these pages; thus the necessity for segregating this material under the heading "Large Uses of Steel in Small Ways" has been obviated.

STEEL *will continue to expand the attention given to seeking out and describing the manifold uses of steel in its many forms, thereby enhancing to a considerable degree the general subject of this department, originated by* STEEL *12 years ago.*

Zirconium Alloys *make* TOUGH STEEL



• Zirconium alloys used in the finishing operations at the furnace increase the toughness and machinability of steel. Zirconium combines readily with oxygen and nitrogen. It improves the impact value of high-phosphorus steels. It minimizes the detrimental effect of sulphur.

The particles of zirconium compounds formed in the steel are small, well-distributed, and not objectionable. Thus zirconium refines grain size. High resistance to impact and good machinability result. Strong tough steel is obtained.

Electromet Metallurgists will gladly use their vast fund of practical and unbiased data to show you how to use zirconium alloys to improve your steel. A request today will bring complete information without obligation.

PRODUCTS OF A UNIT OF
UCC
UNION CARBIDE AND CARBON CORPORATION

CHROMIUM
High-Carbon Ferrochrome (maximum 6% carbon)
Low-Carbon Ferrochrome (in grades, maximum 0.06% to maximum 2.00% carbon)
Chromium Metal
Chromium-Copper
Miscellaneous Chromium Alloys

SILICON
Ferrosilicon 15% Ferrosilicon 50%
Ferrosilicon 75%
Ferrosilicon 80 to 85%
Ferrosilicon 90 to 95%
Refined Silicon
(minimum 97% Silicon)
Calcium Silicon
Calcium-Aluminum-Silicon
Calcium-Manganese-Silicon
Miscellaneous Silicon Alloys

BRIQUETS
(Patented)
Chrome Briquets Silicon Briquets
Manganese Briquets

COLUMBIUM

TUNGSTEN

MANGANESE
Standard Ferromanganese
78 to 82%
Low-Carbon Ferromanganese
Medium-Carbon Ferromanganese
Spiegeleisen
Manganese Metal
Manganese-Copper
Miscellaneous Manganese Alloys

SILICO-MANGANESE
All grades including Silico-Spiegel

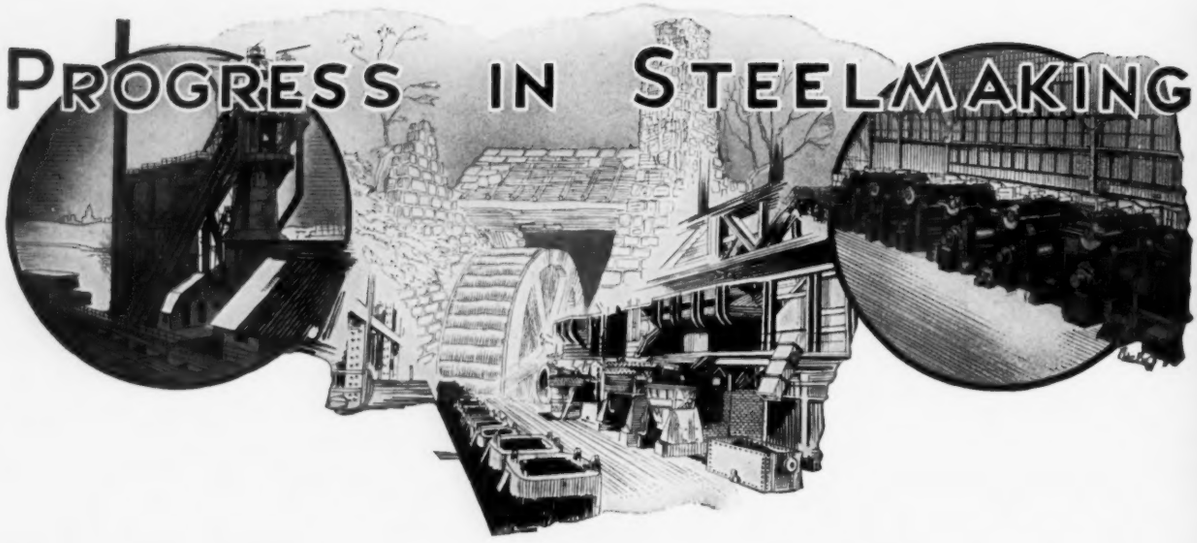
VANADIUM
All Grades

ZIRCONIUM
35 to 40% Zirconium
12 to 15% Zirconium
Aluminum-Zirconium

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
CARBIDE and CARBON BUILDING
30 EAST 42nd ST., NEW YORK, N. Y.

Electromet
Ferro-Alloys & Metals

PROGRESS IN STEELMAKING



Develops Layout Solution

An efficient fluid for use in laying out plates and other metal work has been developed. The fluid has marked advantages over copper sulphate ordinarily used for this purpose in that it provides a dark background against which scribed lines show up with pronounced contrast. The contrast relieves the eye strain and aids the mechanic in working to the desired layout. The surface of the work merely is wiped fairly clean and the fluid is brushed down; it dries instantly. Polishing the surface is unnecessary.

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Traces Cause of Failure

Causes of mold failure, according to a careful survey made in England, indicates that numerous molds fail because of major cracking. The principal factor causing this major cracking is the inability of the material to accommodate itself to the unequal expansion which occurs when the mold is in service. Premature failure of ingot molds through certain types of cracks, such as corner cracks at the top end, frequently can be obviated by the design. Conditions of use, such as ingot spacing in pouring, also will improve molds in connection with transverse face cracking.

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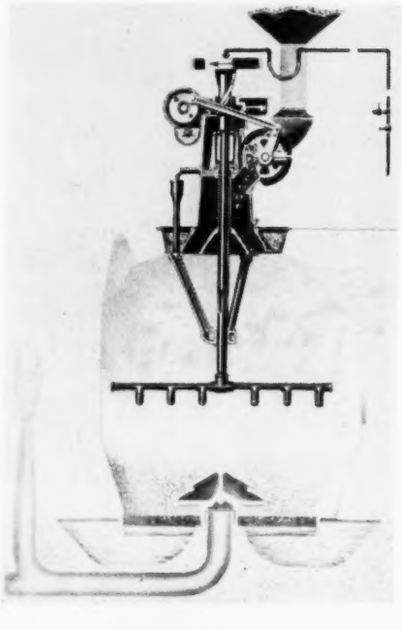
Gas Torch Is Recommended

When welding hard facing metal on any kind of rolling mill guides the use of an acetylene torch is recommended. Some plants use the metallic arc for applying the facing to the surface of roughing mill guides and acetylene for depositing the metal on finishing mill guides. With either process it is advisable to preheat the guide to avoid shrinkage cracks in the facing metal. When facing small guides, therefore, the acetylene torch will be found more economical to use inasmuch as the facing material can be flowed smoothly into the openings of the smaller shapes and thus minimize grinding costs.

• • •

Modernizes Gas Producers

EFFICIENCY OF FIVE OBSOLETE, HAND-POKED GAS PRODUCERS at the Steubenville, O., division of the Wheeling Steel Corp. has been increased by the installation of floating agitators of the Chapman type. These are continuous stirring devices that convert hand-poked producers to semi-mechanical feed. They not only feed the coal into the producer and distribute it evenly over the fire bed but stir the fire bed and keep it leveled off, preventing blowholes. Increased heating value of the gas, less wastage of fuel, and increased producer and furnace capacities are reported



Resists High Temperature

Extreme temperature problems relative to a coating for use on metals are met by a high-heat resistant enamel now available. The product withstands temperatures up to 1000 degrees Fahr. without discoloration, chalking or peeling and is not affected by cleaning solutions, alcohol, acids or alkalis. It may be sprayed or brushed and is made in colors of silver or black.

• • •

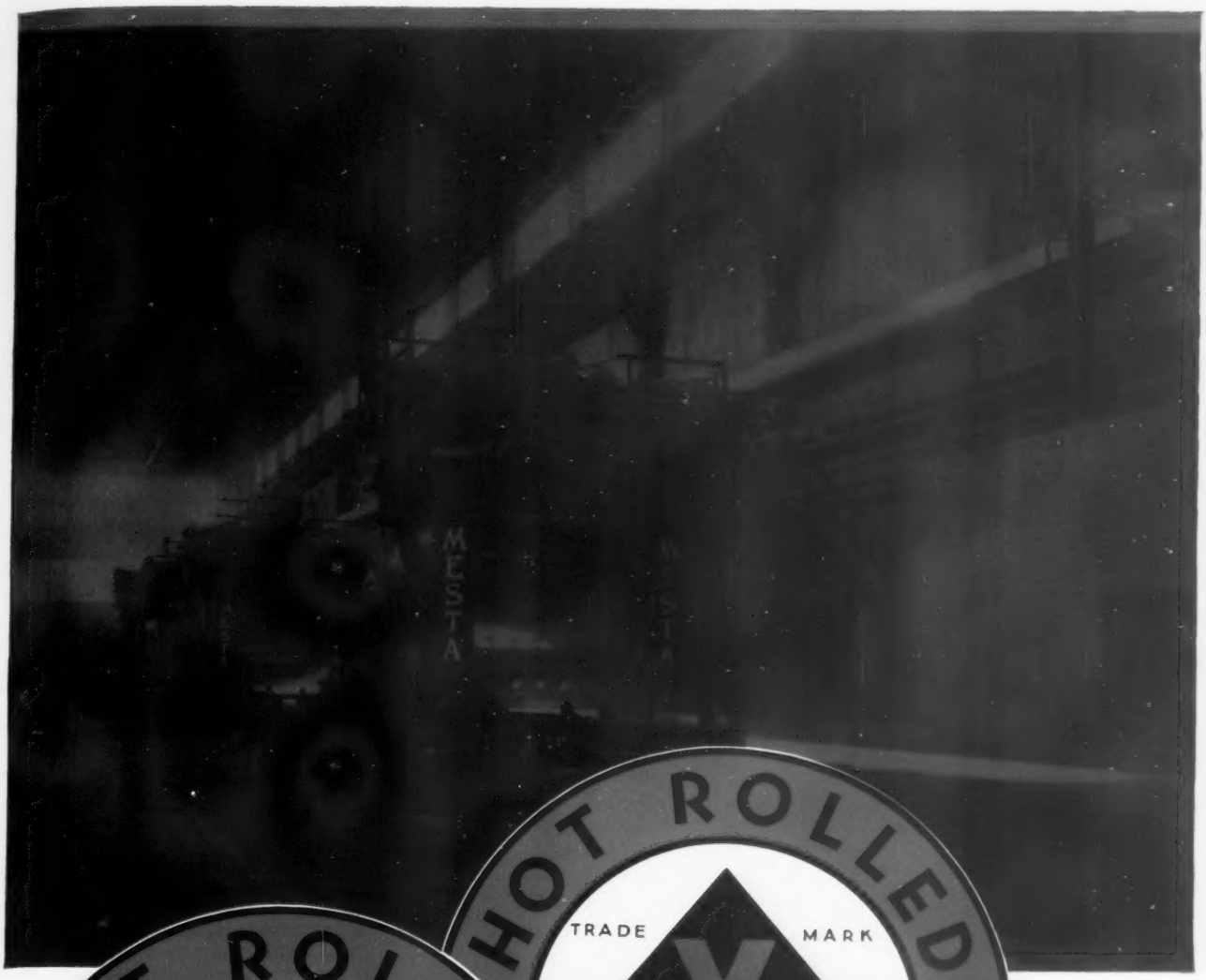
Treats Bars Electrically

Alloy steel bars in lengths of 30 feet now are heat treated electrically at a steel plant in the Chicago district in two furnaces each rated 600 kilowatts. The furnaces, which are of the elevating hood type with a car bottom, are served by a single quenching crane and tank. The crane is controlled automatically and is designed to allow the operator to make and select any one of several cycles at will.

• • •

New Roll Being Developed

Rolls for blooming mills now are being developed that will afford greater wear and at the same time have greater resistance to slippage and fire cracking. The practice of "ragging" rolls for blooming and slabbing mills is being abandoned in order to prevent ragging lines appearing on the surface of the finished product. Special hardened steel base rolls are at present in the stage of development and experimentation at a roll foundry in this country.



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Employs Multipass Welding On High-Pressure Piping

DETAILS associated with construction of a high-pressure, high temperature steam generating system at the plant of United States Industrial Alcohol Co., Baltimore, were presented by J. A. Freiday, mechanical engineer, Thomas J. Murray Inc., New York, at the Nov. 14 technical session of the International Acetylene association, which held its 36th annual convention at the Cleveland hotel, Cleveland, Nov. 12-15.

Welding of the piping was accomplished by the Aircowelding process employing backhand technique, the author explained. The finished line, which connected two plants of the company, contained 496 twelve-inch line welds, 16 six-inch tee or nozzle welds and numerous smaller welds.

Multipass welding was employed on all the high-pressure piping while single pass welding was used on the medium pressure piping. The use of multipass welding on heavy wall pipe insures better quality welding, the speaker contended. All welds in the high-pressure piping 4 inches diameter and larger were stress-relieved by heating to 1450 degrees Fahr. and holding at this temperature in the ratio of one hour per inch of thickness.

Pressure Vessel Welding

During early attempts to perfect the application of welding to pressure vessels construction to meet Class I requirements, oxyacetylene welding was neglected somewhat and its possibilities overlooked, stated G. W. Plinke, director of research, Henry Vogt Machine Co., Louisville, Ky., in speaking on "Gas Welding of Class I Pressure Vessels." This he attributed to the fact that most of the construction in this class required welding in thicknesses above which the oxyacetylene process appeared to be applicable commercially. Then, too, the electric process indicated greater economy and ease of securing the required physical results with multilayer deposit. The oxyacetylene process therefore was confined in application to construction equivalent to Class II requirements and no particular attention paid to developing a procedure to accomplish the physical properties specified in Class I construction.

After several years of fabricating welded pressure vessels and power boilers in accordance with Class I construction, using the coated electrode electric arc process with the required special technique of control, we began to make some investigations regarding the possibilities of oxyacetylene welding, the speaker stated. Numerous tests were made to determine the physical properties of the weld metal using regular gas welding procedure. The early results showed that the tensile strength was generally satisfactory, but the ductility, particularly on place thicknesses above ½-inch, was not sufficient to meet Class I code requirements.

In an attempt to overcome this difficulty, Mr. Plinke stated, various types of experimental welding grooves were employed. Best results in the heavier plate thicknesses were obtained with the double V-groove, with the U-type groove showing good possibilities in plate thicknesses from 1-inch upward. The U-type groove, however, required a special technique and care had to be exercised to prevent the molten metal from running in front of the puddle and causing laps.

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A report of previous sessions of the International Acetylene association was presented in Nov. 18 issue of STEEL, *page* 15

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In experimenting with these types of grooves, it was found that laps and nonfusion along the sidewalls could be entirely overcome. Laps were frequently found where the operator changed his welding rod, and in starting up again failed to get the parent metal to a sufficiently high temperature to fuse properly with the newly deposited metal. The speaker attributed nonfusion to welding at too great a speed and neglecting to notice whether the metal was actually fusing into the sidewalls, or to the operator's depositing to heavy a layer of weld metal in one pass in the groove.

Another variable investigated which seemed to give a definite improvement in welding was the proper adjustment and maintenance of the type of flame employed. Prior to this investigation, a neutral flame always had been used, the speaker explained. However, it was found that a reducing or slightly excess acetylene flame materially improved the ductility of the weld metal, and such defects as porosity or oxide inclusions practically were eliminated. Numerous test plates were welded, stress relieved at 1200 degrees Fahr. and X-rayed. The exographs of these welds showed exceptionally good quality.

Since it has been learned that practically the same protecting atmosphere surrounding the molten puddle of weld metal can be obtained with the proper gas flame as is now obtained with the correct coating on an electrode in electric arc welding, a new field of investigation for improvements in welding appears entirely feasible. Mr. Plinke mentioned that for some time it has been the aim and hope of manufacturers of welded products and electrode producers to develop a satisfactory automatic welding machine using covered electrodes which would consistently produce Class I welding at a saving in time and cost of materials. Some practical machines have been developed, but none that is acceptable from the standpoint of economy and consistency of results as required in commercial production.

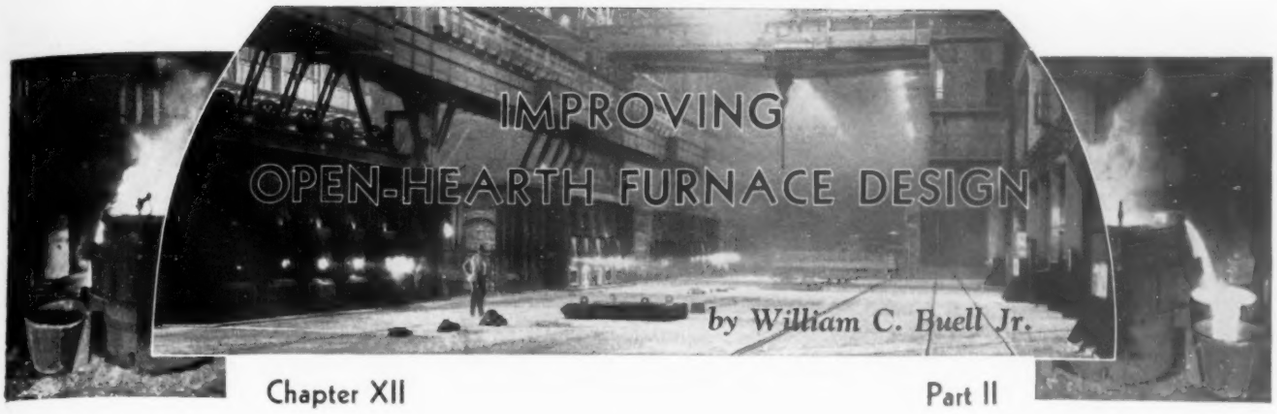
With the knowledge gained from investigation of atmospheres developed by gas flames, the speaker was of the opinion that in the near future an automatic welding machine will be constructed that will combine and make use of the good qualities in both the gas and arc processes. With a combination of these two processes, it is entirely feasible that an automatic machine can be built to use a coil of bare wire electrode which will make the welding operation continuous, while the necessary inert atmosphere, so essential to good quality welding, will be secured with the aid of gases from some combination of oxygen and acetylene or other available gases. When such a machine is perfected, he predicted, welding costs will be greatly reduced and an important forward step made in the art of uniting metals for industrial purposes.

Activity in Marine Field

The trend to higher pressures and temperatures in the marine field ever is increasing, the highest pressures on American vessels now in operation being 450 pounds per square inch, the total temperatures ranging from 700 to 750 degrees Fahr. This was brought out by J. W. Wilson, engineer, bureau of navigation and steamboat inspection, department of commerce, in a paper entitled "Welding Piping and Pressure Vessels in the Marine Field" but which in the absence of the author was presented by H. L. Whittemore, material engineer, national bureau of standards, Washington.

One of the leading shipyards now is working on designs for a ship which is intended to operate at 1200 pounds working static pressure and a total temperature of 850 degrees

(*Please turn to Page* 62)



IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter XII — Part II

Valves

AN APPROVED type air valve is shown in Fig. 197. The valve and seat are of cast iron, with the beveled contact surfaces machined to a tight fit. The three guides assure the correct centering of the valve on its seat. The seat carefully is set level in the supporting masonry, made fast with the appropriate bolts and grouted as indicated to eliminate all leakage under the casting.

The height of the lift of the valve from its seat in inches necessary to develop an area at the periphery equal to the area through the nominal diameter of the seat (full opening) is diameter in feet times three. This relation is plotted in Fig. 198.

For forced draft operation, a sheet metal hood to enclose the valve as indicated is required. The hood should be constructed strongly, welded to tightness and care exercised in its attachment to the valve seat.

The heavy valves of natural draft operation occasionally are removed or omitted in forced draft operation, but they should be retained under all conditions because better operation and control may be had with air valves of this type than with any other. The development of the brickwork should be accomplished in accordance with the design of Fig. 197, in order that the flow of air into the regenerator flue may take place in the least turbulent manner.

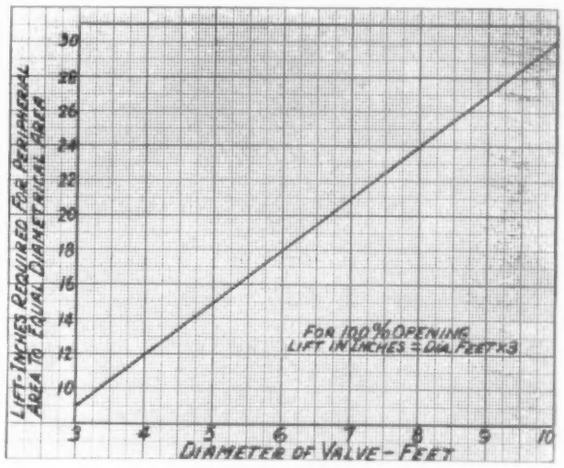
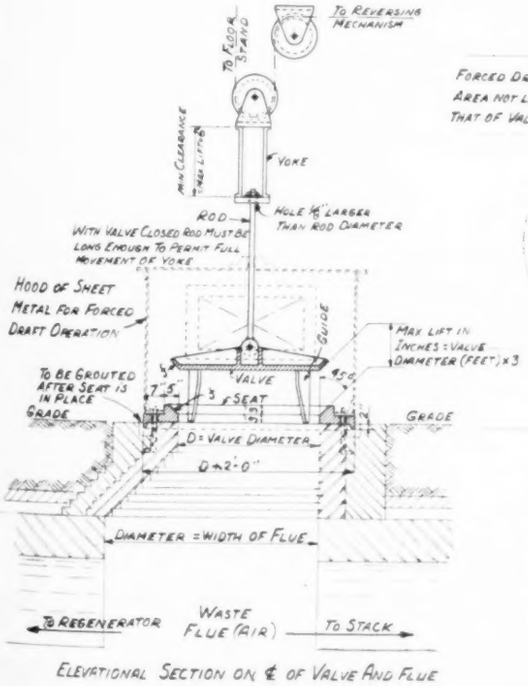
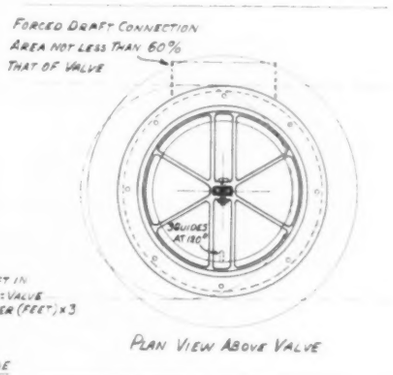


Fig. 198—Lift of circular valves necessary to secure area at periphery equal to area through seat



ELEVATIONAL SECTION ON ℄ OF VALVE AND FLUE



PLAN VIEW ABOVE VALVE

Fig. 197—Principal details of approved air inlet valve and seat with setting and rigging. Arranged for natural or forced draft

If a furnace is not equipped with a waste-heat boiler then the stack damper merely becomes a medium by which the draft is regulated and any reasonable amount of leakage between the valve and its seat will have no effect on operation. Consequently, a dry type, i. e., no water-cooling, slide and seat should be used if the metal of which they are constructed will withstand the temperature in the flue at the base of the stack without warping or otherwise deforming. For such service the seat may be omitted entirely and the valve hung vertically. This arrangement is illustrated, Fig. 199, but is not recommended.

The maximum temperature at the stack base may be considered as 1500 degrees Fahr. (Table CXXIX, lines 19 to 21). Should a waste-heat boiler be included, then the stack damper must be as fully sealed as any reversing valve, for if with the boiler operating leakage occurs around the stack damper a part of

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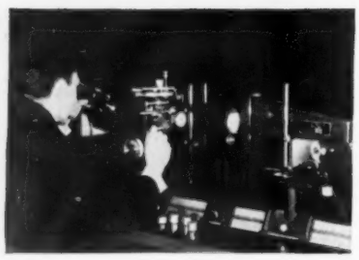

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ELECTRIC FURNACE AND OPEN HEARTH • ALL STANDARD AND SPECIAL ANALYSES

the gases entering the stack at the boiler outlet above may recirculate, interfering greatly with furnace and boiler draft conditions. Accordingly, the stack damper and its seat must bear together to a machined fit.

A water-cooled valve of the type illustrated, Fig. 195, will be entirely satisfactory for this service, but will be relatively costly because the stack damper is usually of much greater size than the reversing valves.

In the past few years dampers of heat resisting iron-chromium alloys in certain instances have given excellent service at the stack and have been used with a limited measure of success as reversing valves in some smaller open-hearth furnaces.

New Type Damper Developed

The replaceable sectional flexible damper has been introduced recently and the "Fahrite" damper (U. S. Patent No. 1,678,342) is representative of the type. As seen from Fig. 200 the design consists of a number of horizontal sections extending the width of the damper, a section registering with the adjacent sections through a tongue or groove design which insures tightness. The appropriate sections are assembled on a collecting bar and continuing alignment is secured through the weight of the damper itself.

The arrangement shown in Fig. 201, which has a water-cooled seat of lighter design than the reversing valves and a dry slide, will give excellent service as a stack damper under normal operating conditions if well constructed and installed. While the older type of cast metal damper is shown the inclusion of the flexible type of an iron-chromium alloy is recommended. To assure the absence of leakage from the atmosphere and interference with draft conditions the stack as well as all other dampers or slide valves of open-hearth operation should have sheet metal hoods.

With a waste-heat boiler operating, the suction on the furnace side of the stack damper will be at least equal to the normal stack draft and, under some conditions as with fouled checkers, may be considerably more. In accordance with the principles of the prior discussion on the subject the stack damper should be sufficiently heavy to overcome a suction of 6 inches of water after given effect to the angularity of the damper setting. The damper in the waste-heat boiler flue should be of the inclined type and similar in design to the approved stack damper and of the same size. If convenient the setting should be arranged with the bottom of damper towards the boiler; with the boiler inactive and its damper closed the effect of the stack draft will exert added sealing effect.

The rigging of the valves may be accomplished satisfactorily by several methods, their operation may be by hand or motor, and their control may be entirely a manual function or a combination of manual and instrumental actuation. These three factors are discussed with regard to each of the several valves used in the open-hearth ancillary system.

The opening or closing of the producer gas valves, Fig. 195-B, allow or arrest the flow of producer gas to the appropriate gas regenerators at either end of the furnace. No gas flow adjustment is made through these valves, one being fully open while the complementary valve is closed entirely. Thus, through their interconnection at the reversing mechanism, they counterbalance one another and no further counterweighting is necessary. The control of the producer gas flow and pressure through the gas flue is by the adjustment of gas producer operation. The rigging of the producer gas valve is accomplished by cables and sheaves.

Changes Direction of Flow

Two gas reversing valves are a part of the primary reversing system, coacting synchronously with the two air reversing valves to change the direction of fluid flow in the flue system.

For the most perfect balancing and distribution of fluid flow through the four regenerators it is desirable that all of these reversing valves be rigged so that adjustment may be made through floor stands. If for any reason but two of these valves are rigged for adjustment then the valves so rigged should be those reversing the air regenerators. A type or rigging, which will permit the individual adjustment of several interconnected valves, is shown attached to the air inlet valve, Fig. 197. Note that this type of rigging requires double the cable movement to accomplish a given lift of the valve.

The balancing of the flow through the regenerators will be necessary, only occasionally, and, therefore, manually operated floor stands will be satisfactory, provided ball bearing hand wheels are included.

As on account of possible adjust-

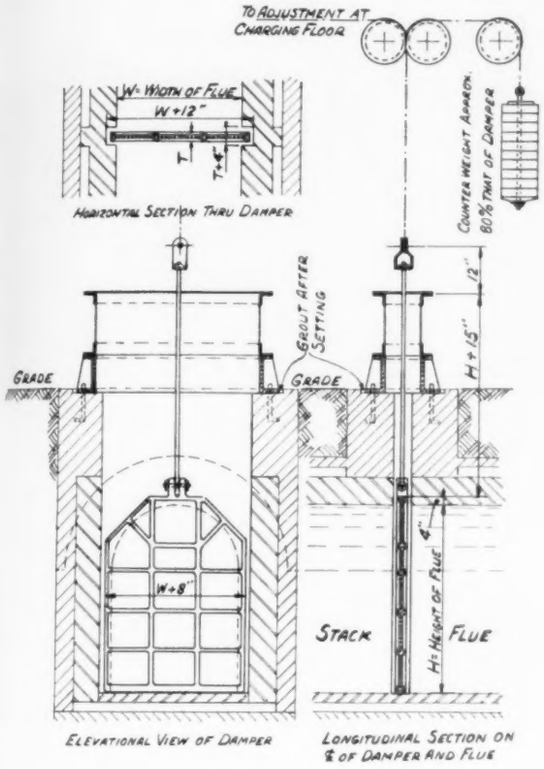

Fig. 199—Simple slide damper suitable only when no waste-heat boiler is installed

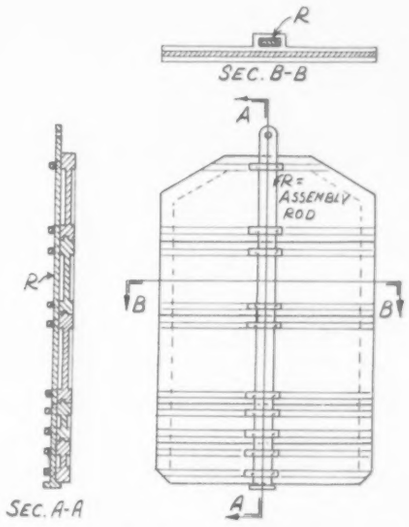

Fig. 200—Typical design of flexible damper made of Fahrite (iron-chromium alloy)

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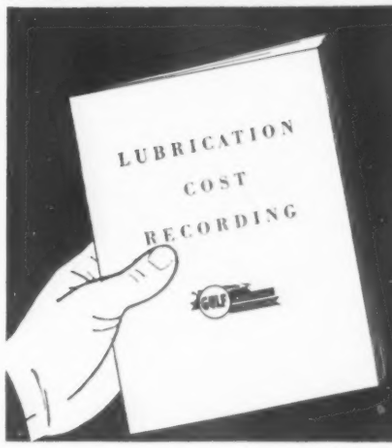

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ments a valves cannot be counted upon to balance each other, all valves should be counterweighed individually to about 80 per cent. When in preheated mixed gas firing the Wellman valve, Fig. 196, is included its operation by its own mechanism reverses the flow of fuel and waste gases in a single cycle. No adjustment of flow is made at this valve.

Affords Better Dust System

Two air inlet valves, Fig. 197, are included in the system. These should be included whether operation is to be by forced or natural draft. While with forced draft operation the air volume will be regulated principally by a rheostat at the control board the use of the valves as shown will permit the layout of a better and more substantial duct system. The air inlet valve as illustrated will be found convenient in regulating the pressure of the air as it enters the system.

In natural draft operation these valves will be the sole means of regulating the air supply. They should be made and installed as carefully as any in the system, and the makeshift air inlet valves often observed should be replaced.

The area of opening at the air inlet valves always is controlled from a floor stand near the operating platform, and frequent adjustments are necessary during a heat if best results are to be obtained. In many plants the hand wheels through which such adjustments are made are often hard to operate and they constitute one of the chief causes of alibi as to failure to make necessary adjustments. Therefore, to remove the alibi cause the adjustment of the air valves should be arranged for motor operation.

The motor operation and adjustment of the air inlet valves and that of the stack damper should be completed as the first and most important step of any control program and prior to the installation of any of the more refined apparatus of control. The air inlet valves are connected to and work synchronously with the reversing mechanism, but on account of the adjustment feature, which may unbalance them, they should be individually counterweighted to about 60 per cent.

The stack damper should consist of a water-cooled slide and seat, Fig. 195-A, or a dry alloy slide and water-cooled seat, Fig. 201.

Where a waste-heat boiler is not included or is out of service, pressure conditions within the furnace proper are controlled principally by stack damper adjustments and for best operation many changes should be made during the course of a heat. In order to remove the source of operating alibi, the floor stand should be arranged for motor operation. The initial expense of the motorizing of the air and stack valves will return handsome dividends from fuel savings and increased production.

The waste heat boiler damper is merely a means to remove the boiler from the operating line or include it thereto. It is not used as an adjustment of fluid flow and is but seldom operated. The waste-heat boiler damper should be of the type shown in Fig. 201 in order to insure tightness. On account of the infrequency of operation, the installation of a simple winch or chain-fall offers an inexpensive and satisfactory operating arrangement.

In the prior chapter it has been stated as a general principle that when a furnace is fired with producer or mixed gas the entire flue system should be designed to develop a relative velocity of the producer gas fuel or the waste furnace gases of not over 20 feet per second at maximum ingot production, and 15 feet relative velocity of the waste furnace gases when firing other fuels. A 15-foot velocity is more nearly the ideal condition or design and operation than the higher velocity, but in producer or mixed gas practice, design on a 15-foot velocity basis would cause the development of a structure of unwieldy size. Consequently, the compromise which when followed admits satisfactory operation.

With the exception of a Wellman reversing valve in the fuel-waste system for mixed gas firing and the disk-type damper at the air inlet of all types, the inclined type of slide valve has obsoleted all other valve types. Primarily for the purpose of preventing the depositing of dust, that might interfere with the complete closing of the valve, and secondarily in order to accomplish a sharper regulation of flow through certain of the valves it is permissible and desirable that the fluid velocities be increased through the valves in order to bring about these conditions.

How Velocities Are Increased

This best is accomplished at the producer gas and reversing valves by reducing the area through the valve seat so that the maximum relative fluid velocity through the valves will be increased to not over 25 feet per second in producer or mixed gas firing and 20 feet per second in other types. Ordinarily, the reduction of valve area is accomplished by lessening only the height of the valve appropriately and raising the sill of the valve seat above the bottom of the flue. The conditions in the typical furnaces regarding the valves installed are shown in Tables CXL to CXLII. The details of the gas fuel and waste (gas reversing) valves are listed in Table CXL.

In accordance with the foregoing discussion the maximum allowable

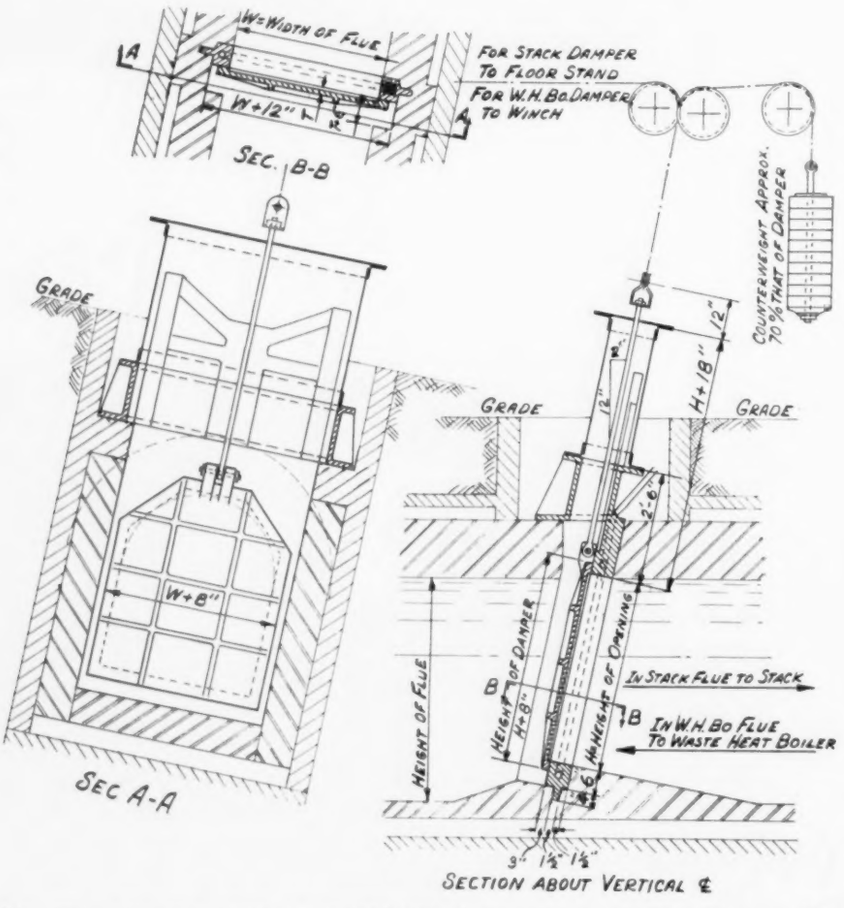

Fig. 201—Approved stack or waste-heater boiler damper built with dry slide water-cooled seat

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This cylindrical, bell-type electric furnace in the River Rouge plant of the Ford Motor Company is the largest yet constructed. It bright-anneals two 16,000-pound coils of steel strip per charge

BASED on the results of tests made with the G-E bell-type bright-annealing furnace shown above, which was installed in the Rouge plant early this year, the Ford Motor Company has purchased thirteen more of these G-E furnaces, complete with atmosphere-control equipment.

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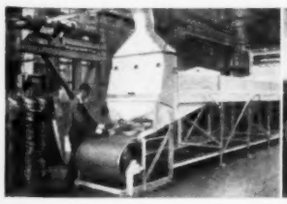
For Electric Furnaces — See General Electric



A complete line of controlled-atmosphere furnaces for bright-annealing at low cost

Air-draw furnaces like this will reduce drawing costs on all kinds of steel parts

Continuous and box-type enameling furnaces for high-quality enameling work at low cost

Write for Bulletin GEA-1495, "G-E Bell-type Furnaces for Bright-annealing Coiled Steel Strip." Address inquiries to the nearest G-E sales office, or to General Electric, Dept. 6A-201, Schenectady, N. Y.

170-30

GENERAL ELECTRIC

Table CXL

Details of Valve Sizes in Fuel Gas and Waste (Gas) Flues

Furnace	Flue A16G Area Table CXXXVIII g	Flue A16G Velocity Table CXXXVIII j	Waste (Reversing) Valve Type Valve	Size	Area, sq. ft.	Velocity ft. sec. as at 32°	Per Cent valve to flue	Flue A14 Area Table CXXXVIII b	Flue A14 Velocity Table CXXXVIII e	Fuel Valve Type valve	Size	Area, sq. ft.	Velocity ft./sec. as at 32°	Per Cent valve to flue
	a	b	c	d	e	f	g	h	i	j	k	m	n	
A	18.5	18.3	Inclined slide	3'0"x4'6"	12.4	27.3	67.	18.5	21.8	Inclined slide	3'0"x4'6"	12.4	32.5	67.
J	22.2	13.3	Inclined slide*	3'3"x4'0"	12.0	24.7	54.	12.0	29.2	Inclined slide*	3'3"x4'0"	12.0	29.2	100.
K	35.0	8.9	Inclined slide					21.2	17.5	Inclined slide				
N	20.5	20.0	Inclined slide	3'6"x4'0"	12.8	32.0	67.	20.5	25.8	Inclined slide	3'6"x4'0"	12.8	38.1	62.
O	28.5	15.7	Inclined slide	3'6"x4'0"	12.8	35.0	45.	25.0	21.3	Inclined slide	3'6"x4'0"	12.8	41.6	51.
I	24.0	7.6	Inclined slide	4'0"x4'6"	16.5	11.0	69.	24.0	——	Inclined slide	4'0"x4'6"	16.5	——	69.
P	18.5	12.2	Seimens	3'6"x4'0"	14.0	16.1	75.	16.5	——	Seimens	4'0" ϕ	12.5	——	76.
G	18.5	11.5	Inclined slide	3'3"x4'0"	11.5	18.5	62.	——	——	——	——	——	——	——
L	30.1	8.4	Inclined slide	4'3" square	18.0	14.0	60.	30.1	5.0	Wellman	3'0" ϕ	7.0	21.5	23.
B	27.0	6.6	Inclined slide	4'0"x4'6"	16.5	10.8	61.	——	——	Mushroom	4'0" ϕ	12.5	——	——
D	20.5	8.2	Dyblie	——	6.12	27.5	30.	14.4	——	Dyblie	——	6.12	——	42.
E	19.0	10.4	Inclined slide	3'0"x4'0"	11.0	20.1	58.	——	——	——	——	——	——	——
H	14.9	9.2	None	——	——	——	——	——	——	——	——	——	——	——
F	35.0	4.8	None	——	——	——	——	——	——	——	——	——	——	——

*Double valve seat one above the other with single slide.

velocity of 25 feet a second through the waste valves in producer and mixed gas practice is exceeded in furnaces A, N, O, as shown in Table CXLI, column f. Throughout these works these three furnaces consistently have shown crowded operations; furnace D with its Dyblie valve has shown similar tendencies. However, as the flue velocities, column b, are all low, it is patent that the size of the valves could be increased likely to the considerable betterment of operation. While the velocities through the producer gas valves, column m, might be somewhat lower the requirements for a much higher velocity at the nozzle, A_n, minimize the effects of the high velocities listed.

In accordance with the ratios of flow in flues and through valves and with recommended velocities through valves achieved the values under "Per cent, valve to flue," columns g, and n, should approximate 80 for producer and mixed gas firing, and 75 for other types. Excepting in the case of furnace P, for the reversing valve, and furnaces J and P for the fuel valve, the percentages shown are much smaller than the allowable, indicating unnecessarily large flues. In large flues the fluid velocities may drop so low as to release large quantities of dust that otherwise would void through the stack; this may cause operating difficulties late in a campaign.

Valve Data Tabulated

The air reversing and inlet valves of the typical furnaces are listed in Table CXLI. The sizes of the air reversing valves as indicated from the velocity values, column f, and their area relative to the flue area, column g, are generally well in agreement with the principles of the prior discussion. However, it probably would ease operating conditions if the valves and likely the flue sections of furnaces A and O were enlarged somewhat. The reversing valves, furnaces P, D, H and F, could have been somewhat smaller and contingently less costly. The free and easy entrance of air into the system in natural draft operation likely has a considerable but unrecognized influence on the general furnace economic performance.

The air valves should be of sufficient size to admit the required air at velocities of 10 or 12 feet per second. Thus, of the typical furnaces listed as operating under natural draft only furnaces I, H and F have valves of sufficient size. The correction of an abridged condition in this respect may be accomplished easily during a rebuild.

The details of the stack and waste-heat boiler valves are listed in Table CXLII. The stack flues of ten of the furnaces are equipped with water-cooled inclined slide dampers and six of the waste-heat boiler dampers are of the same type.

The area of the stack damper selected should be slightly larger

Table CXLI

Details of Valve Sizes in Air and Waste (Air) Flues

Furnace	Flue A16A Area Table CXXXVIII l	Flue A16A Velocity Table CXXXVIII o	Waste (Reversing) Valve Type Valve	Size	Area, sq. ft.	Velocity ft./sec. as at 32°	Per Cent valve to flue	Air Inlet Valve Area, Size Diameter	Area	Air, ft.³/sec. Table CXVIII b	Velocity* ft./sec. as at 32°	Forced draft
	a	b	c	d	e	f	g	h		j	k	l
A	25.6	19.9	Inclined slide	4'2"x4'6"	17.0	30.0	66.	4'0"	12.5	232	19.8	No
J	27.4	16.1	Inclined slide	5'0"x5'3"	23.6	18.7	86.	4'0"	12.5	201	17.2	No
K	40.3	11.5	Inclined slide	——	——	——	——	——	——	212	——	Yes
N	35.0	17.6	Inclined slide	5'0"x5'0"	22.3	27.6	64.	4'0"	12.5	280	23.9	No
O	35.0	19.2	Inclined slide	5'0"x5'0"	22.3	30.1	64.	4'0"	12.5	310	26.5	No
I	49.0	7.6	Inclined slide	5'0"x6'0"	27.3	13.6	56.	5'0"	19.6	179	9.8	No
P	22.3	11.0	Inclined slide	5'0"x5'0"	22.3	11.0	100.	4'3"	14.1	186	14.1	No
G	28.4	11.5	Inclined slide	4'9"x5'0"	21.3	15.4	75.	1—2'6" 1—1'8"	7.5	145	20.6	Yes
L	35.0	10.9	Inclined slide	5'0"x6'0"	27.3	14.0	78.	5'0"	19.6	235	12.8	Yes
B	27.0	6.6	Isley system	none	——	——	——	none	——	173	——	Yes
D	20.5	8.2	Seimens	4'0" Square	16.0	10.5	78.	4'0"	12.5	162	13.8	No
E	21.8	10.4	Inclined slide	5'6"x4'6"	14.3	15.9	65.	4'0"	12.5	206	17.6	No
H	27.6	9.2	Inclined slide	4'6"x5'3"	21.6	18.1	78.	4'6"	15.8	189	12.8	No
F	51.2	4.8	Inclined slide	5'6"x6'0"	29.8	13.8	58.	5'0"	19.6	187	10.2	No
M	33.7	13.7	Inclined slide	6'0"x5'3"	27.8	16.6	83.	5'0"	19.6	222	12.1	Yes

*Calculated with entering air at 100°

than the stack if the stack is of the correct diameter to create the recommended velocities of 20 and 15 feet per second for producer or mixed gas and fixed fuel firing, respectively. Thus the stack valves, column h, of all furnaces, excepting furnace A, N an O, should give the ascribed tonnage of steel under natural draft operation.

Based on Certain Conditions

Natural draft operating conditions must be assumed as the basis of fundamental design, although all of the typical furnaces, except P and B, are equipped with waste-heat boilers and, therefore, are expected to operate normally under forced draft. Accordingly the smaller of the areas of the stack flue, stack damper or stack, controls the volume flow of the fluids and is, therefore the limiting factor of peak operation *unless as a result of faulty design there are "bottle necks" or areal constrictions in other parts of the system.*

The controlling areas in the typical furnaces from comparison of the areas of the stack flue (column a), the stack (column c), and, the stack damper (column g) are designated by bold faced type in Table CXLII.

Thus the stack area, column c, is the smallest and controlling area in furnaces A, J, G, L, D and H; but the stack is too small for satisfactory natural draft operation at the prescribed tonnage rates in the first two named furnaces as well as furnace H.

The stack damper area, column g, controls in furnaces N, O, I, P, F and M. The entire outlet design, furnaces N and O, is too cramped, but that of furnaces I and M entirely satisfactory, while the stack diameter, furnaces P and F, is unnecessarily large. An area of about 25

square feet is shown to produce satisfactory velocities in furnace E. Thus the stack having an area of 46 square feet is nearly twice as large as necessary.

Inasmuch as the furnace gases enter the waste-heat boilers setting under the influence of mechanical draft, the area of the waste-heat boiler damper is not particularly critical. However, a large valve with a contingent low velocity may aid in securing good distribution to and through the boiler.

For many years the importance of good distribution to develop satisfactory boiler operation has been recognized by the manufacturers of the boilers who have specified flue and damper sizes when installing their equipment. The consistently good conditions of flow, column m, Table CXLII, indicate the boiler manufacturers to have been successful in preventing abridgement of desirable design features having reference to the installation of their equipment.

Requires Careful Inspection

At the end of each campaign all components of the valves should be inspected carefully and the water-cooled items thoroughly cleaned inwardly and repaired where necessary. The accumulation of silt at the bottoms and in corners of valves or seats invariably is responsible for leakage and destruction of the metal. The brickwork settings should be inspected carefully and appropriate repairs made in order to hold leakage to the minimum degree.

The careful and correct selection of valves to meet the particular conditions to be encountered, the proper installation of the valves and their rigging, and the necessary means for their operation or adjustment, without manual exertion and conscientious maintenance are prerequisites of any operation in which satisfactory economic results are expected or desired.

(To be continued)

Table CXLII

Details of Valve Sizes in Stack and Waste Heat Boiler Flues

(Governing Area in Black Type)

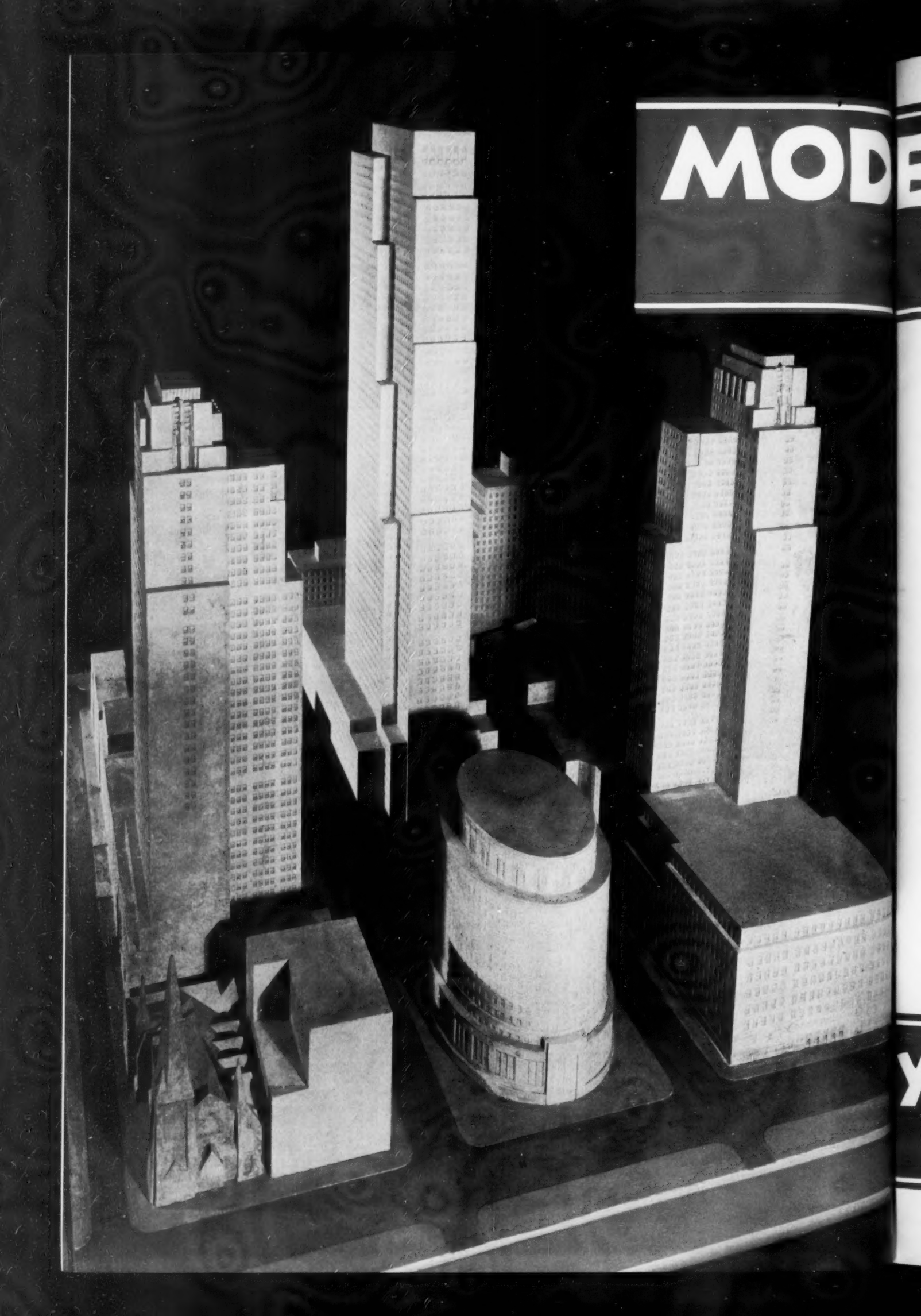
Furnace	Stack Flue A_{19}		Stack A_{20}		Stack Valve					Waste Heat Boiler Valve			
	Area v	Velocity Table CXXXVIII z	Area aa	Velocity dd	Type valve	Size	Area, sq. ft.	Velocity ft./sec. as at 32°	Per Cent valve to stack	Valve Type	Size	Area, sq. ft.	Velocity ft./sec. as at 32°
	a	b	c	d	e	f	g	h	i	j	k	l	m
A	28.0	29.0	**25.1**	32.3	Inclined slide—w.c.*	4'8"x6'6"	28.0	29.0	115.	Inclined slide—dry	4'8"x6'6"	28.0	29.0
J	32.5	21.7	**25.1**	28.0	Inclined slide—w.c.	5'0"x7'0"	32.5	21.7	129.	Inclined slide—w.c.	5'0"x7'0"	32.5	21.7
K					Inclined slide—w.c.					Inclined slide—w.c.			
N	32.8	26.7	34.8	28.2	Inclined slide—w.c.	4'8"x6'6"	**28.0**	31.3	80.	Inclined slide—dry	(2) 6'3"x6'6"	73.0	12.0
O	32.8	32.6	34.8	30.7	Inclined slide—w.c.	4'8"x6'6"	**28.0**	38.2	80.	Inclined slide—dry	(2) 6'3"x5'6"	73.0	14.6
I	54.0	9.7	46.1	11.6	Inclined slide—w.c.	6'0"x6'6"	**35.2**	14.9	76.	Inclined slide—w.c.	6'0"x6'6"	35.2	14.9
P	39.5	11.2	50.3	9.0	Vertical slide—dry	7'0"x6'4½"	**39.0**	11.4	77.	None			
G	57.5	8.8	**46.1**	11.2	Vertical slide—dry	7'0"x9'0"	57.9	8.8	125.	Vertical slide—dry	6'3"x9'6"	55.3	9.2
L	41.3	14.4	**34.8**	17.5	Inclined slide—w.c.	6'0"x7'0"	38.0	15.5	109.	Inclined slide—w.c.	5'0"x7'0"	32.4	18.2
B	44.3	7.6	34.8	——	Isley system	None	——	——	——	None	——	——	——
D	21.8	14.4	**20.8**	15.4	Vertical slide—dry	4'6"x5'6"	21.8	14.4	109.	Vertical slide—dry	4'6"x5'6"	22.7	13.8
E	**25.0**	16.0	46.1	8.9	Inclined slide—dry	5'0"x5'6"	25.0	16.0	56.	Inclined slide—dry	5'0"x5'6"	25.8	14.6
H	23.1	15.8	**20.8**	18.0	Inclined slide—w.c.	4'6"x5'3"	21.6	16.9	103.	Inclined slide—w.c.	4'6"x5'3"	21.6	16.9
F	35.0	11.0	46.1	8.4	Inclined slide—w.c.	5'0"x6'0"	**27.2**	14.3	59.	Inclined slide—w.c.	5'0"x6'0"	27.2	14.3
M	35.3	12.2	40.1	11.0	Inclined slide—w.c.	5'0"x6'0"	**27.2**	15.8	68.	Vertical slide—dry	5'0"x6'6"	30.2	14.2

*w.c., water cooled.

Send Weight Records Over Wires at Chemical Show

Remote registration of weight will be demonstrated by the Toledo Scale Co. at the Exposition of Chemical Industries in New York, Dec. 2-7. This first utilization of an entirely new method will be applied in this instance to the weighing of persons at the scale company's booth. Any visitor is welcome to step on a scale which will do the weighing but will have a blank dial; his weight will be registered by electrical transmission on a printweight scale across the booth.

Having successfully transmitted weight a limited distance over electric wires, the scale engineers foresee that it is only a step to increasing that distance. The possibility of using radio as the means of transmission is obvious. Applications of the new development are expected to be numerous in operations where actual work is remote from head offices, such as in many chemical, mining, blast furnace, coke oven and steel works operations.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YEARBOOK ISSUE 1936

ON JANUARY 6

NEW EQUIPMENT

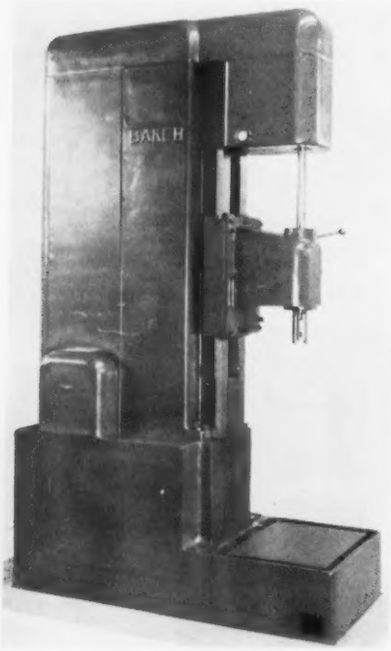
Hydraulic Feed Drilling Unit—

Baker Bros. Inc., Toledo, O., recently introduced a new model No. 10-HO single spindle hydraulic feed drilling machine, shown herewith. One control lever governs the cycle and also is used as an emergency reversing lever should the occasion arise. Feeding pressure is supplied by a hydraulic pump which together with the driving motor is built into the base of the machine. When a lubrication system is required it also is driven by the driving motor and is incorporated in the base of the machine.

◆ ◆ ◆

General Purpose Grinders—

Delta Mfg. Co., 620 East Vienna avenue, Milwaukee, is bringing out a new line of 7-inch general purpose grinders. They are being offered in three models, a pedestal type, shown herewith, for general machine shop and toolroom service; a bench model with a single-phase motor, and a belt-driven model. One of the unusual features of the new machines is the "Twin-Lite" safety shield which not only protects the operator's eyes from flying particles of abrasive, but also incorporates a lighting system that makes the grinder completely self-contained, portable and independent of the shop lighting system.



Baker hydraulic drilling machine features "Clean-Line" design

◆ ◆ ◆

Packingless Valve—

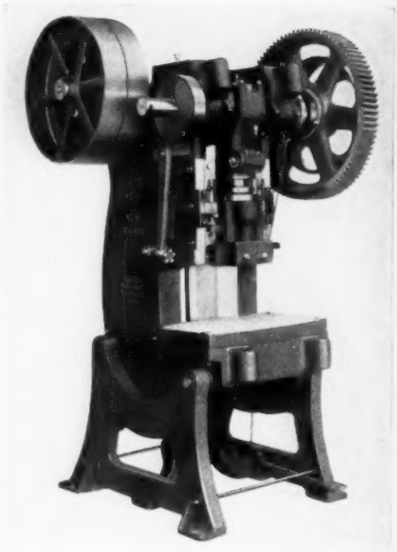
Chemical Equipment Co., Montpelier, Ind., is manufacturing a quick-change packingless valve made in all metals or special alloys that can be cast and machined. The body is in one piece and all wearing parts are made removable for replacement without taking valve from the line.

Delta pedestal type general purpose grinder is self contained

◆ ◆ ◆

Inclinable Punch Press—

Rockford Iron Works, Rockford, Ill., is bringing out a new No. 5-½R inclinable open back punch press, shown herewith. A new locking device consisting of a split plug and draw bolt is used to lock the adjusting screw to the connecting rod. An alloy crankshaft with both brake collar and clutch collar forged in one piece is employed. Capacity of the unit is 56 tons.



Rockford No. 5-½R inclinable open back punch press

◆ ◆ ◆

Globe Valve—

Hancock Valve Co., 101 Elias street, Bridgeport, Conn., is bringing out a new union bonnet bronze globe valve embodying a superhard stainless steel valve disk and seat ring. These are claimed to prevent wire drawing, steam cutting and galling. The design provides tight back-seating and permits easy repacking while the valve is in pressure service. Made for steam pressures up to 300 pounds, this valve is available in both globe and angle patterns.

◆ ◆ ◆

Sheet Metal Screws—

American Screw Co., Providence, R. I., is announcing a line of case hardened sheet metal screws with the new Phillips recessed, self-centering head. As shown on p. 59, a tapered recess which exactly fits a tapered driver takes the place of the slot in the conventional screw. Used

for joining sheet metal and making fastenings to sheet metal, the new screw has many features. It holds on the point of the driver and may be brought into position with one hand. The self-centering feature prevents the driver from slipping sideways. Only four sizes of Phillips

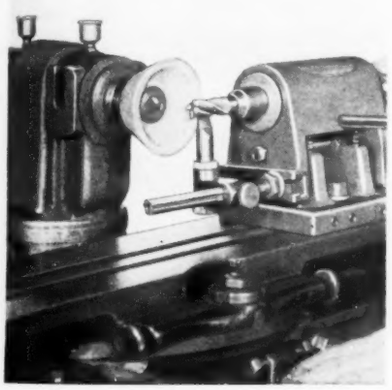
This shows the recessed, self-centering head of the new sheet metal screws and bolts introduced by American Screw Co.

drivers or bits are necessary to drive the entire range of screw sizes, and two sizes of drivers fit the range of sizes most commonly used. Bits are available for all power or manual drivers.

♦ ♦ ♦

End Mill Sharpening Fixture—

Weldon Tool Co., 321 Frankfort avenue, Cleveland, is bringing out a new end mill sharpening fixture. The device, shown herewith, is adaptable to all types of fast steep spiral end mills as well as to slow spiral types,



Weldon end mill sharpening fixture

and will handle left or right-hand spirals and cuts with equal facility. It consists of a cast iron base and a rocking head and finger, the latter being fully adjustable for all sizes of mills from ¼ to 2-inch flute diameter, straight shank type. Extra bushings can be supplied for handling taper shank mills if required.

♦ ♦ ♦

Centrifugal Pumps—

Worthington Pump & Machinery Corp., Worthington avenue, Harrison, N. J., recently developed open impeller non-clogging centrifugal pumps for handling solid materials in suspension, gritty liquids, liquids containing stringy material, etc. A wide range of sizes are available. These units, one of which is shown herewith, are available in all iron, all bronze, or brass fitted. Ratings range from 10 to 250 gallons per minute against heads of 10 to 100 feet; ½ to 7½ horsepower; 1500 to 3600 revolutions per minute; al-

Worthington non-clogging monobloc centrifugal pump

ternating or direct current; single phase or polyphase. Special constructions and characteristics also are available.

♦ ♦ ♦

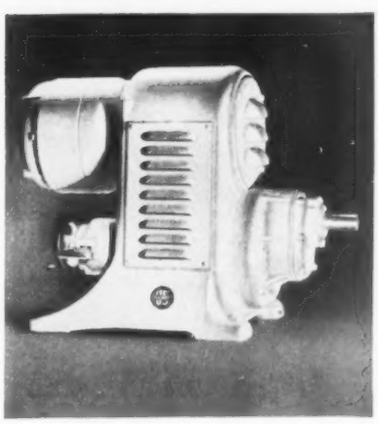
Variable Speed Unit—

U. S. Electrical Mfg. Co., Los Angeles, is building it "Varidrive" in an upright design. One of the advantages in using this type of unit, shown herewith, is the savings in lateral space. The design also gives the user the option of having the take-off shaft at either the high or low position. Infinite variations in speed with local or remote control are features of this device.

♦ ♦ ♦

Grain Size Measuring Eyepiece

Bausch & Lomb Optical Co., Rochester, N. Y., is announcing a new grain size measuring eyepiece



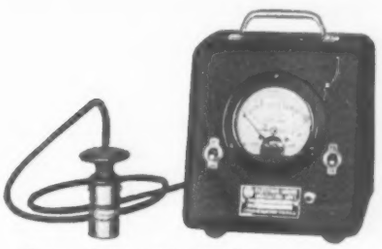
U. S. Varidrive now is offered in upright design

that follows the suggestion of Dr. Marcus Grossman for a quick, easy and accurate determination of grain size according to A.S.T.M. numerical index. The new device is direct reading. The eyepiece is a 7.5X Huygenian type with a built-in revolving circular plate containing eight glass micrometer disks with accurately ruled squares. These disks are numbered from 1 to 8 inclusive. Squares represent 1, 2, 4, 8, 16, 32, 64 and 128 grains per square inch on the magnified image of the specimen. These divisions correspond with the numbered standards of the A.S.T.M. The eyepiece can be employed equally well visually and in photomicrography.

♦ ♦ ♦

Thickness Gage—

General Electric Co., Schenectady, N. Y., is marketing a new electric gage developed for measuring the thickness of porcelain enamel, paint,



General Electric thickness gage

or other nonmagnetic materials such as celluloid, glass, mica, etc., which have been applied to or laid on flat sheets or plates of steel or iron. Thickness ranges of 1 to 5, 2 to 10, 5 to 25, 10 to 50, and 20 to 100 mils can be obtained. A separate scale on the indicating instrument is required for each thickness range. Either single- or double-range indicating units are available, the latter combining any two of the standard ranges.

♦ ♦ ♦

Locking Device for Nuts, Bolts

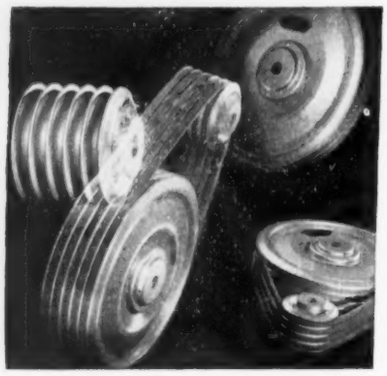
Ancorlox Co., 1170 Broadway, New York, is offering a new type of locking device for nuts and bolts. In this device the washers are blanked out of soft steel, brass or other materials with the outside diameter of the blank larger than the counterbore in the nut, and the inside diameter of the blank is smaller than the diameter of the nut. The washer is then formed. This forming operation decreases the outside diameter and increases the inside diameter, thus allowing the finished washer to be slipped over the bolt and into the counterbore of the nut in locking position. The washer can be locked with an Ancorlox nut or a hollow punch. When the washer is pressed

flat, a high pressure is created on the rim of the nut and on the bolt. This pressure, in conjunction with the positive locking tongue of the washer which slides in the grooved bolt, completes the lock.

♦ ♦ ♦

Sheaves for V-Belt Drives—

Allis-Chalmers Mfg. Co., Milwaukee, has announced additional stock sizes to its line of "Texsteel" sheaves



Allis-Chalmers extends line of Texsteel sheaves for V-belt drives

for V-belt drives, now making it possible to furnish these drives up to 15 horsepower. Grooves of the entire line are so designed that they can be used with A section belts (½ x 11/32-inch) or with B section belts (21/32 x 7/16-inch), depending on the application. The standard line now includes 25 different diameters of sheaves from 3 up to 18 inches inclusive for any number of grooves from 2 to 6 inclusive. All these sheaves now are available with interchangeable type hubs which are carried in stock with bores in 1/16-inch increments from ½-inch up to the maximum bore.

♦ ♦ ♦

Bearing Units—

Link-Belt Co., 910 South Michigan avenue, Chicago, has developed a new line of bearing units known as the Link-Belt Shafer self-aligning roller bearing series 400. Shown herewith, these units are available for pillow blocks, flange bearings,

Self-aligning roller bearing unit introduced by Link-Belt Co.

Safety chipping goggle marketed by Chicago Eye Shield Co.

hangers and take-ups. Self-alignment of Shafer roller bearings is provided by concave rollers between convex outer races and a spherical inner race on the sleeve, which is free to deflect with a shaft temporarily misaligned or out of line because of inaccuracies of installation.

♦ ♦ ♦

Wide Vision Chipping Goggle—

Chicago Eye Shield Co., 2298 Warren boulevard, Chicago, is announcing a wide vision chipping goggle equipped with a super safety lens. Shape of the eye cups allow natural, full and wide vision. In addition to the improved optical properties of the lenses, a special hardening process toughens the glass to enable it to withstand severe blows and impact hazards.

♦ ♦ ♦

Drill—

Black & Decker Mfg. Co., Towson, Md., is offering a new ½-inch drill to meet the demand for a ver-

Black & Decker ½-inch junior drill

satile tool adaptable to many drilling and cutting applications. The unit, shown herewith, is amply powered for drilling holes in steel up to ½ inch. Its universal motor operates on either alternating or direct current. While the standard voltage is 110, it also can be supplied for 32, 220 or 250 volts without additional charge.

♦ ♦ ♦

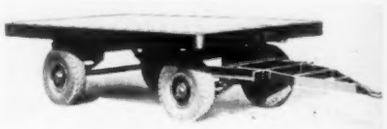
Hydraulic Pump—

Hydro-Motive Co., 1001 West Washington boulevard, Chicago, is marketing a new hydraulic pump, the crankshaft of which is mounted in roller bearings and reciprocates four pistons 90 degrees apart sealed by piston rings; also two spool valves 180 degrees apart which likewise are sealed by piston rings. Normally the fluid is circulated through an idling valve from the crankhousing which is also the reservoir. When the idling valve is in working position, the fluid is conducted through another spool valve with two outlets. This valve is controlled from a pressure-regulating valve.

♦ ♦ ♦

Industrial Trailer—

Mercury Mfg. Co., 4118 South Halsted street, Chicago, is offering a new spring-suspended, pneumatic tired trailer of the fifth wheel steer type. The unit, shown herewith, has a capacity of 4000 pounds. Deck is 26½ inches high when unloaded, is of kiln-dried hard wood and set in a heavy T-iron frame 60 inches wide



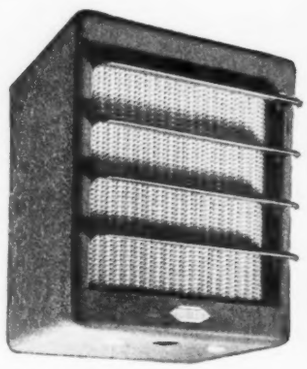
Mercury Industrial Trailer

and 108 inches long. Automotive type semi-elliptic springs mounted on one solid and one sliding shackle are employed. A 60-inch loop handle hitch is provided for easy handling and steering, and a clevis coupler is set back under the frame to enable pushing the trailer from the rear.

♦ ♦ ♦

Unit Heaters—

Fedders Mfg. Co. Inc., Buffalo, is announcing seven new models to its line of series 3 unit heaters. These additions, one of which is shown



Fedders Unit heater

herewith, provides sizes and capacities up to 1300 EDR. The line now comprises 20 standard models. Well graduated spacing between each capacity assures the correct and most economical size for every requirement.

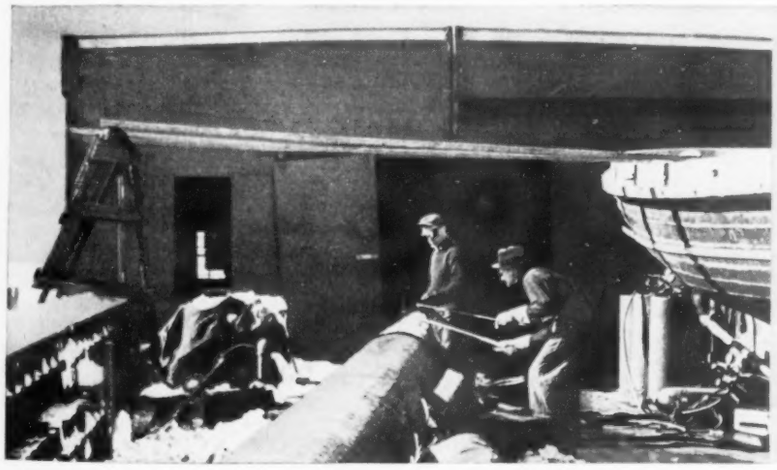
Save maintenance dollars with

OXWELDING

OXY-ACETYLENE welding saves money in maintenance work by putting broken metal parts together and making them stronger than before. Metal is added to worn parts to rebuild them to normal. Wear-resistant alloys are welded to parts subject to abrasion. Oxwelding enables quick alterations to machinery or piping systems, the strengthening of structures, the construction of guards and countless other routine maintenance projects. The flexibility of oxwelding makes it the indispensable repair and maintenance tool.

Bring your maintenance and repair program to Linde, and let Linde Process Service help you secure the maximum benefit from your use of oxy-acetylene welding and cutting. The Linde Service Operator is the representative who makes the results of Linde research, development and field experience available to your organization.

You can obtain this help by communicating with the nearest of the 30 Linde Sales Offices located in principal cities and 30 East 42nd Street, New York, N. Y. Address: The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation.



● *One of the four spuds used on a harbor dredge for anchoring each corner of the barge in place was broken in two. Following the instructions from the Linde Service Operator, a circumferential weld was made using Oxweld No. 1 High Test Steel Welding Rod. The spud was put back in service at a small fraction of the replacement cost, and dredging operations were resumed without the delay which would have occurred had it been necessary to obtain a new spud.*

Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES

FROM UCC LINDE UNION CARBIDE

PRODUCTS OF UNITS OF UNION CARBIDE AND CARBON CORPORATION

New Trade Publications

Lathe—South Bend Lathe Works, South Bend, Ind. A catalog on its new nine-inch precision lathe in eight models; illustrated.

Tools—L. S. Starrett Co., Athol, Mass. Catalog No. 25 and supplement, revised edition, covering its line of tools and precision implements.

Diesel Engines—Caterpillar Tractor Co., Peoria, Ill. A booklet in simple language, devoid of technical discussion, telling the how and why of this type of engine and its applications.

V-Belts—Allis-Chalmers Mfg. Co., Milwaukee. Catalog No. 1259 on Texrope drives for machine tools, well illustrated to show wide applications of this form of V-belt drive.

Ampco Metal—Ampco Metal Inc., Milwaukee. A leaflet, engineering data sheet No. 22, devoted to use of this metal to give rigidity and accuracy in machine tools.

Unit Heaters—L. J. Wing Mfg. Co., 154 West Fourteenth sreet, New York. Bulletin No. U-3 on unit heaters for general purpose heating, including engineering data and illustration.

Diatoms—Johns-Manville, 22 East Fortieth street, New York. A booklet describing adaptations of diatomaceous earth, under the title, "Research Puts the Diatom to Work," well illustrated.

Unit Heaters—Modine Mfg. Co., Racine, Wis. Catalog No. 635, describing four new types of unit heaters, embodying features utilized in other models.

Bearings—Norma-Hoffman Bearings Corp., Stamford, Conn. A bulletin devoted to machine tool applications of the company's ball, roller and thrust bearings, illustrated by blueprint cross sections.

Sheets—Bethlehem Steel Co., Bethlehem, Pa. Two folders, Nos. 333 and 334, describing the corrosion-resisting qualities of its Beth-Cu-Loy sheets as determined by tests in areas where the atmosphere is especially destructive.

Optical Aids—Bausch & Lomb Optical Co., Rochester, N. Y. A booklet on optical aids in the metalworking industry, describing toolmakers' microscope, optical drill gage, optical protractor, centering level and optical flats.

Compressors—Worthington Pump & Machinery Corp., Harrison, N. J. Bulletin No. L611-B5A on its 5, 7 and 9-inch single horizontal, single stage steam and motor driven compressors; Bulletin L611-B4A on 12 and 13-inch models.

Diamond Dressers—Koebel Diamond Tool Co., 1221 Oakman boulevard, Detroit. A booklet with humorous slant in headings and illustrations, but serious intent in the text, relating to proper dressing of grinding wheels by its diamond dressing tools.

Welding—Linde Air Products Co., 205 East Forty-second street, New York. An illustrated booklet on the repair of damaged cast iron machinery by the oxyacetylene process; discusses applications for which bronze welding and fusion welding are best suited.

Expansion Bolts—Rawlplug Co. Inc., 98 Lafayette street, New York. A booklet on its new drive anchoring device for use in masonry, containing descriptive sketches showing its great holding power, how and where it is used, its advantages, how to select proper size and other data.

Welded Steel Rings—King Fifth Wheel Co., 5027 Beaumont avenue, Philadelphia. A pamphlet describing welded steel rings and flanges rolled from standard bar stock; starting in 1904 to manufacture fifth wheels for wagons the company has progressed to heavier types for automobile trailers and steel rings of all dimensions.

Bearings—Fafnir Bearing Co., New Britain, Conn. A bulletin on super-precision ball bearings for spindles, discussing comprehensively the bearing problems of machine spindles and types of bearings they require; specifications and methods of application of pre-loaded type required to eliminate shaft or spindle displacement under load.

Give Papers at I.A.A. Meeting

(*Concluded from Page* 46)

Fahr, and the author emphasized the necessity for improved methods of fabrication in which fusion welding seems destined to displace existing methods of construction.

At the present time, he declared, there is an insistent demand and urgent need for extending the welding code of the bureau which was developed by a subcommittee of the committee on welding in marine construction of the American Welding society. The code as it now stands, the author explained, permits welding piping for 100 pounds per square inch only. The successful use of welded boilers and pressure vessels, and the fact that experimental work has been done along these lines, seems to justify the development of a code for the welding of high pressure piping in position on shipboard. The committee on welding in marine construction is at present giving this matter careful thought and study.

In recommending the developing of such a piping code, the author was of the opinion that drastic qualifying tests should be prescribed for the welding operators; that special attention should be given to the selection of welding rods, and that only the best quality of high-test welding rods should be permitted. It might be necessary for the bureau to establish an approved list of welding procedures to insure safe welds. It should be the aim of the committee to endeavor to secure welded joints which would have as nearly as possible the physical characteristics of the base metal. The test specimens should be welded in position without turning the pipe, welds being made vertically and horizontally. The tension test specimen should be tested in the full section of the pipe, particular attention being given to securing complete penetration. It would be most desirable if some reasonable means could be devised as a substitute for the X-ray to determine the soundness of the joints.

Recondition Tracks

Of 24 of the most important railroads in the United States and Canada, said L. J. Turner, chief rail inspector, Rock Island railroad, Chicago, 50 per cent use the oxyacetylene process exclusively in reconditioning rail ends, fastenings, frogs and switches in track. Two use arc welding only while the rest use both arc and gas methods.

During the past few years, he said, the railroads have deferred the purchase of hundreds of thousands of tons of new rail with the result that the reconditioning of rail ends is an economic necessity. Such reconditioning not only lengthens the service life of rail but permits the maintenance of smooth riding track for high speed traffic. Mr. Turner described the methods employed by his railroad in reconditioning track with the oxyacetylene torch.

Armstrong Chimn, chief engineer, Alton railroad, Chicago, described the methods by which his road reduced the running time between Chicago and St. Louis to 5½ hours, using its new, high speed, streamlined train, the Abraham Lincoln. To permit smooth riding at speeds up to 80 miles per hour, it was necessary to reduce the radii of many curves, to lay much new track and to fill in battered ends and worn surfaces. This was accomplished through the use of oxyacetylene welding equipment.

The Atlantic Coast Line railroad makes extensive use of the oxyacetylene process in cutting and welding in connection with the construction and maintenance of steel cars and locomotives. Shop methods employed were described in detail by James Grant, superintendent of motive power. Following Mr. Grant's talk the nature of the work by the Atlantic Coast Line was illustrated by means of a motion picture.

The session also was featured by a motion picture of track work reconditioning on English railroads. This was shown through the courtesy of the British Oxygen Co. Ltd., London.

Price Definition Awaited; Rate at Year's High

Some Advances for First Quarter Expected This Week; Demand Is Strong

MARKET IN TABLOID

DEMAND *. . . Strong, automotive specifications heavier.*

PRICES *. . . Scrap advances; finished steel announcement expected this week.*

PRODUCTION *. . . Ingots up 2½ points to 54½ per cent. This is equal to the highest rate previously reached this year.*

SHIPMENTS *. . . Increasing.*

UNCERTAINTIES pertaining to finished steel prices for first quarter are expected to be cleared away by producers this week, preparatory to opening books for that period Dec. 2, in line with former code practice.

While majority opinion has strongly favored advances, up to the close of last week there was no positive indication of which products are to be raised, or amounts. In this respect the situation was unlike that which prevailed under the code when prices were announced ten days prior to the opening of books.

It appeared that there was no definite decision, though some interests intimated that sheets and strip, wire, and bars are likely to be increased, with no change in pipe, plates, shapes, or tin plate.

Meanwhile, as an evidence of the general strength in iron and steel markets, scrap continued to rise. At Chicago most grades were up 50 cents, to a parity with Pittsburgh.

Iron and steel shipments gave further indications of a pronounced bulge late this month and in December, possibly to reach the year's high point next month.

Steelworks operations rose 2½ points to 54½ per cent, with Pittsburgh up 2 points to 46 per cent; Chicago 4 to 61; Cleveland 3 to 80; Youngstown 3 to 56; Detroit 6 to 94. Declines were noted only at Wheeling, down 6 to 78; and Birmingham, off 11½ to 46½, with other districts unchanged. This week the Thanksgiving holiday may cause some temporary recession.

Many consumers have placed protective contracts, though the volume of their specifications will depend on the trend of prices. Actual consumer requirements, however, are believed to form the main basis for present activity. Certain manufacturing lines usually affected adversely by seasonal influences are either holding their recent gains, or expanding.

Sheet mill operating average has increased several points to 70 per cent, and producers are sold up for the rest of the year on automotive sheets. For the present, automobile manufacturers are not attempting to speed schedules, output last week increasing only 2000 units to 95,000. Pressure for delivery of material, however, is strong, and orders have already been placed for sheets, strip, and other steel products for enrollment as soon as mill books are opened.

Reports of an impending increase of $3 a ton on rails, though lacking verification have led to larger purchases, 43,600 tons of rails and fastenings being booked last week, including 20,000 tons of rails and 13,600 tons of fastenings for Chicago, Burlington & Quincy, and 10,000 tons of rails for Southern railway. Pennsylvania railroad is inquiring for 16,000 car wheels, and St. Louis & San Francisco has asked for court consent to spend $1,800,000 for rails and accessories.

Approval was given at Washington last week to several hundred grade eliminations, which fabricators estimate will require 45,000 tons of structural steel. Shape awards for the week dropped to 12,209 tons, compared with 19,795 tons in the preceding week.

Pig iron producers estimate November and December shipments will be the largest of the year. Increased buying of scrap for export is noted. The Carnegie-Illinois Steel Corp. is scrapping 1000 Bessemer & Lake Erie freight cars for 15,000 tons of scrap, and Pennsylvania may scrap 32,000 to derive 300,000 to 400,000 tons.

Instead of a price advance in ferromanganese, as recently contemplated, there may be some reduction, as the new trade agreement with Canada lowers the American duty on ferromanganese from $33.60 to $17.92 a gross ton.

STEEL's iron and steel composite is up 1 cent to $33.17, due to scrap prices. The finished steel composite remains $53.70, while the scrap index has risen 16 cents to $13.12, highest since June, 1930.

(For an explanation of the reference here last week to a year-end inventory tax please turn to page 82).

COMPOSITE MARKET AVERAGES

	Nov. 23	Nov. 16	Nov. 9	One Month Ago Oct., 1935	Three Months Ago Aug., 1935	One Year Ago Nov., 1934	Five Years Ago Nov., 1930
Iron and Steel	$33.17	$33.16	$33.16	$32.84	$32.68	$32.15	$31.95
Finished Steel	53.70	53.70	53.70	53.70	54.02	54.00	49.62
Steelworks Scrap	13.12	12.96	12.83	12.72	12.05	9.82	11.17

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Nov. 23, 1935	Oct. 1935	Aug. 1935	Nov. 1934
Finished Material				
Steel bars, Pittsburgh	1.85c	1.85c	1.80c	1.80c
Steel bars, Chicago	1.90	1.90	1.85	1.85
Steel bars, Philadelphia	2.16	2.16	2.11	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.40	2.40	2.55	2.60
Semifinished Material				
Sheet bars, open-hearth, Youngs	$30.00	$28.00	$28.00	$28.00
Sheet bars, open-hearth, Pitts.	30.00	28.00	28.00	28.00
Billets, open-hearth, Pittsburgh	29.00	27.00	27.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

	Nov. 23, 1935	Oct. 1935	Aug. 1935	Nov. 1934
Pig Iron				
Bessemer, del. Pittsburgh	20.81	$19.81	$19.81	$19.76
Basic, Valley	19.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	20.81	19.81	19.81	19.76
No. 2 foundry, del. Pittsburgh	20.31	19.31	19.31	19.26
No. 2 foundry, Chicago	19.50	18.75	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	21.68	20.68	20.68	20.63
Malleable, Valley	19.50	18.50	18.50	18.50
Malleable, Chicago	19.50	18.75	18.50	18.50
Lake Superior charcoal del. Chi.	25.25	24.90	24.25	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	90.13	89.79
Gray forge, del. Pittsburgh	19.67	18.67	18.67	18.63
Scrap				
Heavy melting steel, Pittsburgh	$13.75	$13.65	$13.25	$11.15
Heavy melt. steel, No. 2, east. Pa.	11.00	11.00	10.50	8.35
Heavy melting steel, Chicago	13.75	12.50	12.35	9.10
Rails for rolling, Chicago	14.75	14.00	13.65	10.35
Railroad steel specialties, Chicago	14.25	13.50	13.55	10.05
Coke				
Connellsville, furnace, ovens	$3.55	$3.55	$3.25	$3.60
Connellsville, foundry, ovens	4.35	4.35	4.00	4.60
Chicago, by-product foundry, del.	9.75	9.75	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.18c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.08c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

(Base, 5 to 25 tons)

Pittsburgh	1.85c
Chicago or Gary	1.90c
Duluth	2.00c
Birmingham	2.00c
Cleveland	1.90c
Buffalo	1.95c
Detroit, delivered	2.00c
Pacific ports, f.o.b. cars, dock	2.40c
Philadelphia, del.	2.16c
Boston, delivered	2.27c
New York, del.	2.20c
Pitts., forg. qual.	2.10c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	2.06c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight carloads; less than straight carloads take trade quantity extras; 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.	
Standard wire nails	$2.40
Cement coated nails	2.40
Galvanized nails, 15 gage and coarser	4.40
do. finer than 15 gage	4.90

(Per pound)

Polished staples	3.10c
Galvanized fence staples	3.35c
Barbed wire, galv.	2.80c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$58.00

To Manufacturing Trade

Plain wire, 6-9 gage	2.30c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250 carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅞-in.	
Pittsburgh	1.85c
Chicago or Gary	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop,	
Pittsburgh	1.95c
Chicago	2.05c
Cold-strip strip,	
Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
20-45 lbs.	$28.00
45-50 lbs.	$25.00
50-60 lbs.	$26.00
70-75 lbs.	$24.50
80-90 lbs.	$26.00
100 lbs.	$27.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll, qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	75 off
Rolled thread, ½ x 6, smaller	75 off

Machine Bolts

All sizes, cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts	75 off
Tire bolts	60 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	75 off
Step bolts	70 off
Elevator bolts	70 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	75 off
Do., ½ to 1-inch	75 off
Do., over 1-inch	70 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, expect on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

In.	Blk.	Galv.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots or 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are uoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base, $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$29.00
Philadelphia	34.67
Duluth	31.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	30.00

Slabs

Pitts., Chi., Cleve., Young.	29.00

Wire Rods

(Common; combination up $2)

*Pitts., Cleveland	40.00
*Chicago	41.00
*Worcester, Mass.	42.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.80c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.55- 3.75
Connellsville, fdry.	4.35- 4.50
Connel., prem. fdry.	5.50- 5.75
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del.	11.50
St. Louis, del.	10.00
Birmingham, ovens	6.00
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del.	9.00
Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol		18.00c
Toluol		30.00c
Solvent naphtha		30.00c
Commercial xylol		30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	6.75c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	20.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm.	22.50	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	20.58	20.58	20.08	.....
Cincinnati from Birmingham	20.20	.....	19.20	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.93	21.93	21.43	22.43
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.07	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25

Delivered from Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
St. Louis, northern	20.00	20.00	19.50	.....
St. Louis from Birmingham	†19.62	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.00
Pitts. dist. fur.	19.00	Do., del. Chicago	25.25
		Lyles, Tenn.	22.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75. Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional. Each unit over 3%, $1 per ton additional.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo.	$45.00
Alabama, Ga., Ky.	$40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$20.00
*Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$16.00-17.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsb'gh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro. del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Nov. 16	9.25	9.37½	8.85	52.12½	48.70	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 18	9.25	9.37½	8.85	52.00	48.37½	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 19	9.25	9.37½	8.85	51.50	48.37½	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 20	9.25	9.37½	8.85	50.87½	48.37½	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 21	9.25	9.37½	8.85	51.20	48.45	4.50	4.35	4.85	*19.00	15.00	35.00
Nov. 22	9.25	9.37½	8.85	50.87½	48.50	4.50	4.35	4.85	*19.00	15.00	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.62½
Copper hot rolled	16.25
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	16.62½
Seamless copper	16.75
Rods	
High yelow brass	13.12½
Copper, hot rolled	13.50
Anodes	
Copper untrimmed	14.00
Wire	
Yellow brass (high)	15.12½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	5.50- 5.75
Cleveland	5.87½-6.12½
Chicago	5.87½- 6.00
St. Louis	6.00- 6.25
Heavy Copper and Wire	
*New York, No. 1	7.00- 7.25
Chicago, No. 1	6.87½-7.12½
Cleveland	6.75- 7.00
*St. Louis, No. 1	7.00- 7.25
Composition Brass Borings	
New York	5.00- 5.25
Light Copper	
New York	5.75- 6.00
Chicago	5.37½-5.62½
Cleveland	5.75- 6.00
*St. Louis	5.75- 6.00
Light Brass	
Chicago	3.25- 3.50
Cleveland	3.12½-3.37½
St. Louis	3.50- 3.75
Lead	
New York	3.50- 3.75
Cleveland	3.25- 3.50
Chicago	3.37½-3.62½
*St. Louis	3.65- 3.75
Zinc	
New York	2.00- 2.25
Cleveland	2.50- 2.75
St. Louis	2.75- 3.00
Aluminum	
Borings, Cleveland	8.50- 9.00
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast, St. L.	13.00-13.50
Clips, soft, Cleve.	14.75-15.00
SECONDARY METALS	
Brass ingot, 85-5-5-5	9.25
Stand. No. 12 alum.	17.00-17.50

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.50
Boston, dock, expt.	9.50- 9.75
Boston, domestic	7.50- 7.75
Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.00-10.50
Chicago, No. 1	13.50-14.00
Cleveland, No. 1	12.25-12.75
Cleveland, No. 2	11.25-11.75
Detroit, No. 1	9.25- 9.75
Detroit, No. 2	7.50- 8.00
Eastern Pa., No. 1	12.00
Eastern Pa., No. 2	11.00
Federal, Ill.	9.25- 9.75
Granite City, R. R.	10.25-10.75
Granite City, No. 2	8.75- 9.25
N. Y., deal. No. 2	7.50- 7.75
N. Y., deal. barge	8.50- 8.75
Pitts., No. 1 (R. R.)	14.50-15.00
Pitts., No. 1 (dlr.)	13.50-14.00
Pittsburgh, No. 2	12.00-12.50
St. Louis	8.75- 9.25
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.00-10.50
Chicago, factory	12.50-13.00
Chicago, dealer	11.50-12.00
Cleveland	11.75-12.25
Detroit	9.50-10.00
E. Pa., new mat.	11.50-12.00
Pittsburgh	13.50-14.00
St. Louis	6.25- 6.75
Valleys	12.75-13.00

BUNDLED SHEETS

Buffalo	8.00- 8.50
Cincinnati, del.	7.50- 8.00
Cleveland	9.50-10.00
Pittsburgh	12.25-12.75
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati	7.00- 7.50
Detroit	5.00- 5.50
St. Louis	4.75- 5.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	14.50-15.00
Chicago (3 ft.)	15.00-15.50
Chicago (2 ft.)	16.00-16.50
Cincinnati, del.	13.50-14.00
Detroit	12.50-13.00
Pitts., open-hearth, 3 ft. and less	15.50-16.00
St. Louis, 2 ft. & less	13.25-13.75

STEEL RAILS, SCRAP

Boston	7.50- 7.75
Chicago	13.50-14.00
Pittsburgh	14.50-15.00
St. Louis	11.50-12.00
Buffalo	11.50-12.00

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	3.50- 3.75
Buffalo	10.25-10.75
Chicago	7.00- 7.50
Cincinnati, dealers	7.00- 7.50
Detroit, net	7.00- 7.50
Eastern Pa.	9.50
N. Y., deal. fdry.	6.00
St. Louis	8.00- 8.50

COUPLERS, SPRINGS

Buffalo	14.50-15.00
Chicago, springs	14.00-14.50
Eastern Pa.	14.50-15.00
Pittsburgh	15.75-16.25
St. Louis	12.00-12.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	12.00-12.50

RAILROAD SPECIALTIES

Chicago	14.00-14.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	14.50-15.00
Cleveland, billet, bloom crops	15.00-15.50
Eastern Pa., crops	15.50-16.00
Pittsburgh, billet, bloom crops	16.00-16.50
Pittsburgh, sheet bar crops	14.75-15.25

FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	11.50-12.00

SHOVELING STEEL

Chicago	13.50-14.00
Federal, Ill.	9.25- 9.50
Granite City, Ill.	8.75- 9.25

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	11.50-12.00
Chicago, No. 1, net	10.00-10.50
Chicago, No. 2	13.50-14.00
Cincinnati, No. 2	9.50-10.00
Eastern Pa.	12.00-12.50
N. Y., No. 1, deal.	9.50-10.00
St. Louis, No. 1	6.75- 7.20
St. Louis, No. 2	10.25-10.75

SPECIFICATION PIPE

Eastern Pa.	10.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.00-10.50
Chicago, No. 1	11.50-12.00
Cinci., No. 1, deal.	7.50- 8.00
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	8.50- 9.00
Valleys, new, No. 1	12.50-12.75

MACHINE TURNINGS

Birmingham	4.00- 4.50
Boston, dealers	3.25- 3.50
Buffalo	5.75- 6.25
Chicago	6.50- 7.00
Cincinnati, dealers	5.50- 6.00
Cleveland	7.50- 8.00
Detroit	4.75- 5.25
Eastern Pa.	7.50- 8.00
New York, dealers	3.50- 3.75
Pittsburgh	9.25- 9.75
St. Louis	2.25- 2.75
Valleys	9.00- 9.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	7.75- 8.25
Cincinnati, dealers	5.00- 5.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
Eastern Pa.	6.00- 6.50
New York, dealers	1.50- 1.75
Pittsburgh	8.25- 9.25

CAST IRON BORINGS

Birmingham, plain	4.00- 4.50
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	7.75- 8.25
Chicago	6.00- 6.50
Cincinnati, dealers	5.00- 5.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
E. Pa., chemical	10.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.25- 3.75

PIPE AND FLUES

Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	5.50- 6.00
Eastern Pa.	9.00- 9.50
New York, dealers	5.00- 5.25
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.75- 6.00
Buffalo	10.50-11.00
Cleveland	10.00-10.50
Detroit	8.00- 8.50
Pittsburgh	12.25-12.75

FORGE SCRAP

Boston, dealers	4.50- 5.00
Chicago, heavy	14.00-14.50
Eastern Pa.	11.50-12.00

ARCH BARS, TRANSOMS

St. Louis	12.00-12.50

AXLE TURNINGS

Boston, dealers	3.75- 4.25
Buffalo	10.50-11.00
Chicago, elec. fur.	12.00-12.50
Eastern Pa.	11.00
St. Louis	7.75- 8.25

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.50-11.00
Buffalo	14.50-15.00
Chicago, net	14.50-15.00
Eastern Pa.	17.00
St. Louis	12.50-13.00

SHAFTING

Boston, ship point.	13.00-13.25
Eastern Pa.	18.50
New York, dealers	13.50-14.00
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00- 9.50
Boston, iron deal.	6.00- 6.25
Buffalo, iron	11.00-11.50
Buffalo, steel	14.50-15.00
Chicago, iron	13.00-13.50
Chicago, rolled steel	14.00-14.50
Cincinnati, iron	10.00-10.50
Eastern Pa., iron	12.50-13.00
Eastern Pa., steel	14.50-15.00
Pittsburgh, iron	14.00-14.50
Pittsburgh, steel	15.50-16.00
St. Louis, iron	10.00-10.50
St. Louis, steel	12.00-12.50

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 1 mach.	9.00- 9.25
Boston, No. 2	8.00- 8.25
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	12.25-12.75
Buffalo, mach.	13.00-13.50
Chicago, agri. net	10.00-10.50
Chicago, auto	11.00-11.50
Chicago, mach. net	12.00-12.50
Chicago, railr'd net	10.50-11.00
Cinci., mach. cup	10.00-10.50
Cleveland, cupola	12.25-12.75
Detroit, net	10.00-10.50
Eastern Pa., cupola	12.50-13.00
E. Pa., mixed yard	10.50
Pittsburgh, cupola	13.75-14.25
San Francisco, del.	13.50-14.00
Seattle	7.50- 9.00
St. Louis, No. 1	9.50-10.00
St. L., No. 1 mach.	11.75-12.25

HEAVY CAST

Boston, del.	6.25- 6.50
Buffalo, break.	10.50-11.00
Cleveland, break	10.00
Detroit, No. 1, mach. net	12.00-12.50
Detroit, break.	8.50- 9.00
Detroit, auto net	11.50-12.00
Eastern Pa.	11.50-12.00
N. Y., break. deal.	7.25- 7.75
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	11.50-12.50
Boston, consum.	13.50-14.50
Buffalo	14.50-15.00
Chicago, R. R.	15.50-16.00
Cincinnati, agri. del.	11.00-11.50
Cleveland, rail	15.50-16.00
Detroit, auto net	12.50-13.00
Pittsburgh, rail	15.75-16.25
St. Louis, R. R.	13.00-13.50
Eastern Pa., R. R.	14.00-14.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.00
Boston, dealers	8.00- 8.50
Buffalo	12.00-12.50
Chicago	14.50-15.00
Eastern Pa.	13.00-14.00
New York, dealer	10.50-11.00
St. Louis	12.25-12.75

LOCOMOTIVE TIRES

Chicago (cut)	14.00-14.50
St. Louis, No. 1	11.75-12.25

LOW PHOS. PUNCHINGS

Buffalo	14.50-15.00
Chicago	14.50-15.00
Eastern Pa.	15.00-16.00
Pittsburgh (heavy)	15.00-15.50
Pittsburgh (light)	14.50-15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	3.00c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.36c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.35c
New York‡(d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.70c
San Francisco	3.50c
Seattle	3.70c
St. Louis	3.25c
St. Paul	3.25c-3.40c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.36c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.20c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.36c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.46c
Philadelphia*	2.98c
Pittsburgh(h)	3.15c
Portland (i)	3.70c
San Francisco	3.50c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c
PLATES	
Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.50c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.60c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.60c
Boston (g)	2.95c
Buffalo	3.25c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.25c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.40c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c
BANDS	
Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York (d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh (h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c
COLD FIN. STEEL	
Baltimore (c)	3.55c
Boston	3.75c
Buffalo (h)	3.40c
Chattanooga*	3.98c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang. (f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.81c
Philadelphia	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran.(f) (d)	5.80c
Seattle (f) (d)	6.00c
St. Louis	3.60c
St. Paul	3.87c
Tulsa	4.50c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.45c
TOOLS STEELS	
(Applying on or east of Mississippi river; west of Mississippi 1c up)	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c
Uniform extras apply.	
BOLTS AND NUTS	
(100 pounds or over)	Discount
Chicago (a)	70
Cleveland	70
Detroit	70-10
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 inches; (j) shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 21

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.38 3 2 6	$14.17	1 15 0
Basic bessemer	15.38 3 2 6*	12.95	1 12 0
Hematite, Phos. .03-.05	15.99 3 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$27.06 5 10 0	$19.02	2 7 0
Wire rods, No .5 gage	41.82 8 10 0	36.44	4 10 0
FINISHED STEEL			
Standard rails	$40.59 8 5 0	$44.53	5 10 0
Merchant bars	1.65c 7 10 0	1.15c to 1.20c	3 2 6 to 3 5 0
Structural shapes	1.65c 7 10 0	1.14c	3 1 6
Plates, †¼ in. or 5 mm.	1.76c 8 0 0	1.56c	4 5 0
Sheets, black, 24 gage or 0.5 mm	2.09c 9 10 0	2.13c	5 16 0††
Sheets, gal., 24 gage, corr.	2.53c 11 10 0	2.28c	6 5 0
Bands and strips	1.87c 8 10 0	1.46c	4 0 0
Plain wire, base	2.04c 9 5 0	1.96c	5 7 6
Galvanized wire, base	2.36c 10 15 0	2.29c to 2.33c	6 5 6 to 6 7 6
Wire nails, base	2.64c 12 0 0	2.11c	5 15 0
Tin plate, box 108 lbs.	$ 4.61 0 18 9	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.61 3 7 6(a)	$17.13	260	$12.50	370	$25.36 63
Basic bessemer pig iron	17.22 3 10 0(a)	12.52	190	11.83	350	27.98 (b) 69.50
Furnace coke	4.18 0 17 0	6.26	95	3.89	115	7.65 19
Billets	27.06 5 10 0	28.34	430	18.25	540	38.85 96.50
Standard rails	1.82c 8 5 0	2.08c	694	1.65c	1,100	2.42c 132
Merchant bars	1.89c 8 12 0	1.68c	560	.90c	600	2.01c 110
Structural shapes	1.93c 8 15 0	1.65c	550	.90c	600	1.97c 107.50
Plates, †¼-in. or 5 mm.	1.99c 9 1 3	2.10c	700	1.05c	700	2.32c 127
Sheets, black	2.48c 11 5 0§	1.80c	600‡	1.24c	825‡	2.64c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.92c 13 5 0	3.00c	1,000	2.25c	1,500	6.77c 370
Plain wire	2.04c 9 5 0	3.15c	1,050	1.73c	1,150	3.17c 173
Bands and strips	2.06c 9 7 0	1.95c	650	1.26c	840	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66.25 per cent over paper sterling.

Bars

Bar Prices, Page 64

Pittsburgh—Orders for bars have been heavier over the past week than the week preceding, and considerable demand is traceable to requirements of the cold-finishing trade, bars for concrete reinforcement, and material for the automotive trade.

Cleveland—Steel and alloy steel bar manufacturers expect to open books Dec. 2 for first quarter, and it is probable that if a price advance is to be made for that period it will be announced before the end of this month. While sellers and buyers generally anticipated some increase late last week there was no definite indication here of final action. Consumers have contracted freely for this quarter, and heavy releases may follow a price announcement for the next period. Currently, specifications have increased moderately, mainly from automobile forge shops and agricultural implement manufacturers.

Chicago—Bar specifications are heavier, due principally to improved automotive demand. Orders from miscellaneous consumers are steady and total business is in the best volume in more than 30 days. The market currently is firm.

Boston — Protective covering on commercial steel bars has been light. Meanwhile shipments and specifications are steady with buying generally limited to small lots. Forging, alloy and cold-finished are the most active.

New York—With opinion divided as to advances in bars for next quarter and with deliveries relatively easy, there is little protective specifying at this time.

Philadelphia — Specifications for steel bars are well sustained despite lack of forward buying, which should develop when price advances are definitely assured. There is still division of opinion whether an early price increase will be made. With deliveries fairly prompt consumers feel they can afford to await developments.

Youngstown, O.—Buying of steel bars for delivery over the remainder of this year continues brisk, both for common and alloy bars. Auto partsmakers continue to urge immediate shipment of alloy bars. Valley mills now have backlogs extending into the next two or three weeks. Books are not yet open for next year.

Cold Finished

Cold Finished Prices, Page 65

Pittsburgh—No first-quarter price announcement on cold-finished steel bars has been made, but some declaration of price policy is expected from producers soon. The market meanwhile holds at 1.95c, Pittsburgh. Because of automotive activities, the market is now as active as at any time in the last half of 1935.

Plates

Plate Prices, Page 64

Pittsburgh—Treadwell Construction Co., Midland, Pa., which is low on a bid of $66,853.54, Midland, for land pipe for the Fort Peck dam dredges, will require 213 tons of ¾-inch plates if its Nov. 6 bid is approved. This job involves 480 sections of 28-inch pipe, each 12½ feet long. Delivery is expected early in January by McClintic-Marshall Corp., Bethlehem, Pa., on a single steel tank barge for Aetna Oil Service Inc., Louisville. The barge will be equipped with four steel tanks, each 62 feet long and 12 feet in diameter, with a total capacity of 200,000 gallons of petroleum products. Bids are expected to be readvertised by the Louisville, Ky., engineers' office on the steel dredge JEWETT. Recently bids were taken, finding Marietta Mfg. Co. low. This job involves about 500 tons of plates, of which 200 tons are wrought iron. The 1.80c base on plates is firm, and announcement for first quarter is expected to be made early this week, with probabilities favoring an advance.

Cleveland—Railroads have placed some fairly substantial orders for plates for car repairs, including one lot of 275 tons. In other respects the market is quiet, new specifications being limited to carload lots for miscellaneous manufacturing purposes.

Chicago—Plate demand from railroads for car repairs is moderately heavier and a rising trend in consumption by railroads and equipment builders is in prospect. While tank work is relatively quiet, occasional orders are being placed.

Boston—The greater part of several thousand tons of plates for destroyers and submarines being built by private yards at Bath, Me., and Groton, Conn., will be furnished by the Bethlehem, Pa., mill, although other eastern Pennsylvania mills will share in the Bath, Me., requirements. Navy yard needs, 705 tons for Boston, bids Oct. 22, went to the Central Iron & Steel Co., Harrisburg, Pa.

New York—Contracts for corrosion-resisting steel, delivery mainly at Philadelphia, have been awarded by the bureau of supplies and accounts, navy department, Washington, as follows: Jessop Steel Co., Washington, Pa., $15,381.61; Universal Steel Co., Bridgeville, Pa., $13,667.07, and Allegheny Steel Co., $425.95. These contracts were awarded under schedule 6165, opening Oct. 22.

While indications of an advance in steel plates is not as strong as a fortnight ago nothing official has developed. Spot demand appears heavier but little anticipatory buying has been done. City of New York opens bids Dec. 2 on ferries requiring 3600 tons of steel. Bethlehem Shipbuilding Corp., Bethlehem, Pa., appears low on a 35-ton derrick dredge for the United States engineer at New York.

Philadelphia — Buying of steel plates is the lightest for some time, though definite indications of an early increase in prices probably will result in better release of specifications against contracts.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is placing 6500 tons of hull steel for a navy cruiser with 2400 tons of plates going to an eastern Pennsylvania mill.

Seattle—No large projects have developed but demand for light gages for repair and small construction jobs continues active. Tacoma is completing plans for the third unit of the Green River extension program.

Contracts Placed

2480 tons, black and galvanized, bureau of supplies and accounts, navy department, Washington, schedule 6108, bids Oct. 22, to Central Iron & Steel Co., Harrisburgh, Pa.; 705 tons to Boston; 705 tons, Norfolk, Va., 357 each to Philadelphia, Charleston, S. C., and Puget Sound; schedule also includes 1015 tons medium black and galvanized sheets for same points, all but 70 tons black to Alan Wood Steel Co., Conshohocken, Pa., and 70 tons galvanized to Enterprise Galvanizing Co., Philadelphia, going to Central Iron & Steel Co.

1750 tons, 140 tanks for Schlitz brewery, Milwaukee; to A. O. Smith Corp., Milwaukee.

1550 tons, medium black and galvanized plates and sheets, bureau of supplies and accounts, navy department, Washington, delivery Brooklyn; A. M. Castle & Co. awarded 305 tons sheets; Lukens Steel Co., 290 tons, plates and sheets, Enterprise Galvanizing Co., 40 tons sheets, remainder plates and sheets to Central Iron & Steel Co., Harrisburg, Pa.; Schedule 6097, Oct. 15.

500 tons, new hull for government dredge Kewaunee; to Manitowoc Ship Building Co., Manitowoc, Wis.

190 tons, one 1,800,000-gallon tank, Torrance, Calif., to Pittsburgh-Des Moines Steel Co.

185 tons, oil storage tanks, Consolidated Gas Co., Baltimore, to Hammond Iron Works, Warren, Pa.

115 tons, four tanks, Gulf Refining Co., Carthage, Tenn., to Chattanooga Boiler & Tank Co., Chattanooga, Tenn.

100 tons, estimated, 200,000-gallon elevated steel tank, Point Pleasant, N. J., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Unstated tonnage, water tanks, Mar-

maduke, Ark., and Courtland, Ala., latter 50,000-gallon capacity, to Chicago Bridge & Iron Works, Chicago.

Unstated tonnage, 75,000-gallon steel tank and 100-foot tower, Tigerton, Wis., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

1860 tons, pumping units for metropolitan water district, Los Angeles, specification 133; bids opened.

911 tons, water conduits for Vista irrigation district, Vista, Calif.; bids opened.

900 tons, pipe line, Puerto Rico.

500 tons, including 200 tons of wrought iron plates, construction of hull and cabin of the federal dredge JEWETT; bids to Louisville army engineers rejected.

213 tons, ¾-inch plates in 480 sections of 28-inch land pipe, each 12 feet 6 inches long, for dam dredges, Fort Peck, Mont.; Treadwell Construction Co., Midland, Pa., low at $66,853.54, f.o.b., plant.

120 tons, standpipe, 250,000 gallons capacity, Athol, Mass., McClintic-Marshall Corp., Bethlehem, Pa., low.

Unstated tonnage, three 45-foot steel hull, diesel engine survey boats for United States engineer, Louisville, Ky; bids Nov. 12; Charles Hegewald Corp., New Albany, Ind., apparently low.

Unstated tonnage, 100,000-gallon water storage tank, Craigsville, Va., bids Dec. 2.

Unstated tonnage, 100,000-gallon elevated water storage tank, Sharptown, Md., bids Nov. 29.

Unstated tonnage, 450 unlighted welded steel plate buoys with counterweights, bureau of lighthouses, Staten Island, N. Y., to Tippett & Wood, Phillipsburg, N. J., bids Oct. 29.

Sheets

Sheet Prices, Page 64

Pittsburgh—Price increases in all grades of sheets are forecast for definite announcement to the trade some time this week. The question of delivery, and not inventories, however, dominates sheet buyers, especially as regards full finished needs. Late December is now the earliest date at which automobile sheets shipments can be promised. Computing all sheetmaking capacity, some of which is obsolete and therefore not running, common black, galvanized, and full finished operations are at about 70 per cent of capacity, up two to three points from the week preceding. Jobbing mills are still slow to share in the general improvement and are around 55 per cent.

Cleveland—Large orders for sheets have been placed by Ford, General Motors units and Chrysler, and some producers now are sold out for the rest of the year on cold-rolled sheets and enameling stock. Other sellers will not promise delivery before Jan. 1 without first communicating with their mills to determine whether requirements can be fitted in with operating schedules. Sheet mills here and in an adjacent lake district are operating at capacity. Automobile manufacturers have been seeking places on rolling schedules for first quarter. Books will be open Dec. 2 for the first quarter, and while producers have been considering price advances ranges from $2 to $4 a ton, no definite announcement was made up to late last week.

Chicago—Sheet mills are sold out for the balance of the quarter on most descriptions and operations are heavy in attempting to complete shipments of present orders before Jan. 1. Heavy requirements of the automotive industry as well as of a number of other important users is aided by speculative buying in anticipation of higher prices next quarter. Quotations for that period are expected to be announced by Dec. 1.

Boston—Sheet buying is steady, but shows no further improvement, some consumers in fact tapering off specifications slightly. New buying is mainly in small lots for immediate delivery.

New York—Sheet buying is brisk with most consumers convinced there will be price increases for first quarter. Announcement is expected momentarily.

Philadelphia—Sheet consumers are specifying more freely in expectation of higher prices shortly. On certain full-finished grades most sellers now appear out of the market for the rest of this year.

Buffalo—Sheet mills here are operating close to capacity and are booked up for six weeks. It is hoped to obtain sheets from Bethlehem Steel Co.'s new hot mill here in about 30 days, while the cold mill is to go into operation about six weeks after the first unit is completed.

Cincinnati—Buying continues unchecked, and mill books show substantial backlogs in some grades, principally full-finished. Speculative purchasing has not been important.

St. Louis—Consumers are seeking protection because of prospective price advances in the first quarter. Specifications continue in satisfactory volume, and come from a broad diversity of users.

Birmingham, Ala.—Sheet mills continue active, and shipments about equal the output. The sheet mills here have had a longer period of activity than other departments.

Youngstown, O.—Such a constantly growing volume of sheet orders is coming to producing mills, but under increasing pressure for immediate deliveries, as to result in lengthening backlogs. Auto partsmakers continue to furnish most of the current demand and in some instances demand protection into first quarter. Books generally will not be opened until early in December. Whether higher prices will prevail then still seems to be a question among sheetmakers, with chances at this time favoring no change.

Pittsburg, Calif.—The manufacture of steel for California's 1936 license plates has contributed to starting the Columbia Steel Co.'s sheet mill here. The contract will require 1400 tons of No. 24 gage hot-rolled annealed sheets for making 1,500,000 sets of plates. The sheets will be sent to Oakland for stamping and painting.

Transportation

Track Material Prices, Page 65

Rail buying continues to bring moderate tonages to mills, the Chicago, Burlington & Quincy distributing 20,000 tons, with 13,600 tons of fastenings, and the Southern Railway awarding 10,000 tons to the Tennessee Coal, Iron & Railroad Co.

A possibility exists of an advance of $3 per ton in standard steel rails, effective Jan. 1 and this may have some effect in causing current buying. Mills are taking orders to the end of the year at the present price, for delivery up to June 30, 1936.

Concurrently with large projected buying of freight cars dismantling operations are also being undertaken, to obtain some return from cars not fit for service. Bessemer & Lake Erie is retiring 1000 open steel gondolas from which 15,000 to 16,000 tons of scrap will be realized. The cars will be scrapped at the yards of the Carnegie-Illinois Steel Corp. at Duquesne, Pa.

The Pennsylvania will scrap a large number of cars, said to be about 32,000, although the road officially states no definite number has been decided on. The yield is expected to be about 450,000 tons of scrap, spread over probably most of next year.

PWA has announced it will loan $3,000,000 to the Illinois Central for air conditioning and maintenance of equipment.

St. Louis & San Francisco has asked the federal court for permission to expend $1,835,516 during 1936 for 100 miles of 111-pound steel rails, 2,200,000 tie plates, air conditioning 14 coaches and block signal equipment. Chicago & North Western will spend about $75,000 to air condition 39 steel passenger cars.

The Pennsylvania is inquiring for 16,000 wheels for gondolas to be built in its own shops. It is believed all the steel for this road's cars will be bought on its own account, even though some cars may be awarded other builders. Award of the 10,000

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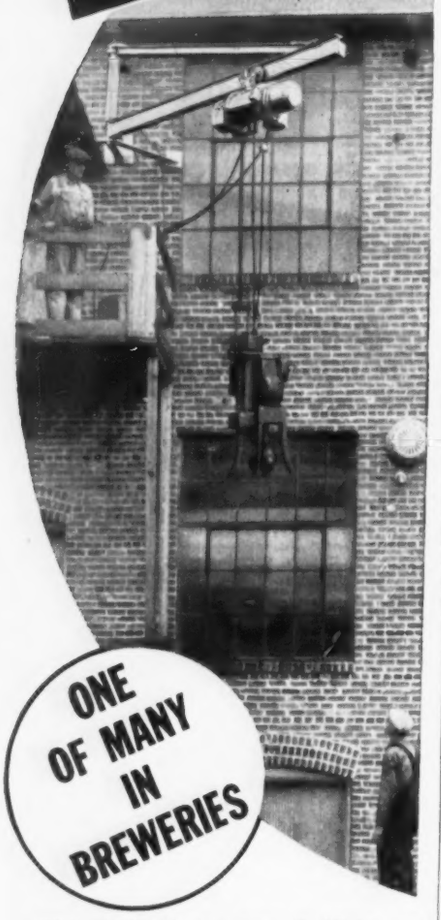

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cars for this road may announced early this week.

Rail Orders Placed

Chicago, Burlington & Quincy, 20,000 tons; 10,500 tons to Carnegie-Illinois Steel Corp., Pittsburgh; 5000 tons to Colorado Fuel & Iron Co., Denver; 4500 tons to Inland Steel Co., Chicago; fastenings involving 13,600 tons distributed among various producers.

Southern, 10,000 tons 130-pound rails, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., for early 1936 rolling.

Buses Booked

American Car & Foundry Motors Co., New York: Six coaches for Blue Way Lines Inc., Springfield, Mass.; three coaches for Mastco Co., New Britain, Conn.; two coaches for Queens-Nassau Transit Lines Inc., New York.

Pipe

Pipe Prices, Page 65

Pittsburgh—Pipe producers have given virtually no indication that discounts on finished tubular products will be changed, even though the price on skelp has been advanced $2 a ton. Such action obviously places the nonintegrated pipe producer at a disadvantage, but at the same time is an effective means toward eliminating price cutting. Previously there has been considerable price irregularity in pipe, mainly traceable to small nonintegrated producers. Operations in district mills are at about 45-50 per cent.

Chicago—Cast pipe demand continues to improve, with both orders and inquiries in the best volume in many months. While most purchases are small individually and are for WPA work, a substantial tonnage is involved in pending purchases and inquiries.

Boston—Spurt in cast pipe buying and inquiry continues, several thousand tons being active or bid. Merchant steel pipe is also slightly more active with a substantial volume of miscellaneous material for Eastport, Me., including valves, fittings and metal culvert pipe being bought. Wrought pipe, while not in heavy demand, is somewhat more active than during recent weeks.

New York—Cast pipe buying and inquiry are heavier, several thousand tons pending. Yonkers, N. Y., bought 880 tons last week from the Burlington, N. J., foundry. Prices are firm.

Continental Oil Co., Ponca City, Okla., has awarded a contract to the Apex Construction Co. to lay a 45-mile main oil line out of Lake Charles, La. Specifications call for the Lindeweld method of oxy-acety-

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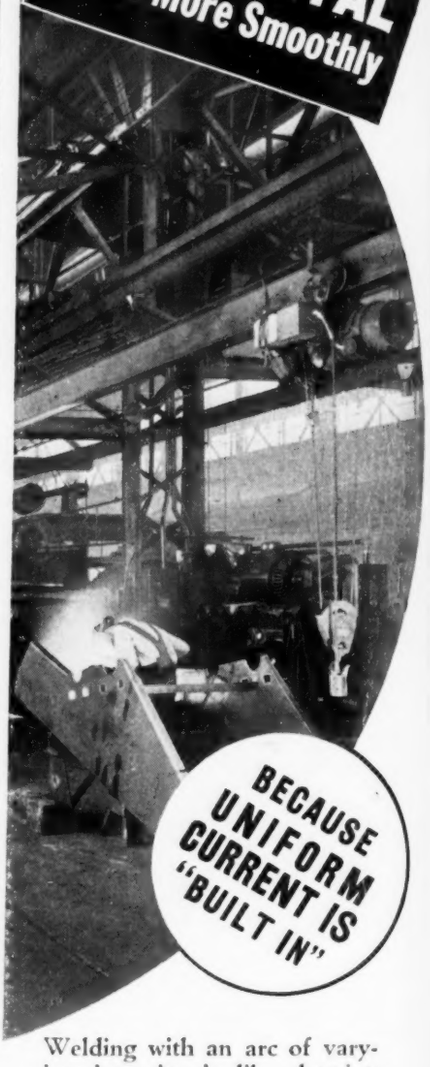

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P&H HANSEN ARC WELDERS

lene welding. It is understood new 6-inch pipe will be used, work to start Dec. 2.

Birmingham, Ala.—While a large proportion of pipe business is in small tonnages growing out of the PWA contracts for waterworks and sewerage systems throughout the South, pipe shops in this territory are busy. Shipments are being made by both rail and truck. Steady operations are predicted for many weeks ahead.

San Francisco—Cast pipe awards for the week were the largest in over two months and totaled 1390 tons. Over 20 cities in Utah, 11 cities in Oregon and eight cities in Washington are taking bids on waterworks improvement systems, involving over 10,000 tons.

Cast Pipe Placed

880 tons, Yonkers, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

600 tons, Torrance, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

500 tons, 12-inch, watermains, Milwaukee, to United States Pipe & Foundry Co., Burlington, N. J.

406 tons, 24-inch, Chicago, to Lynchburg Foundry Co., Lynchburg, Va.

342 tons, water system, Beverly Hills, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

320 tons, Alamo, Tenn., to National Cast Iron Pipe Co., Birmingham, Ala.

250 tons, 4 and 6-inch, Lewiston, Idaho, to Pacific States Cast Iron Pipe Co., Provo, Utah.

100 tons, Eureka City, Utah, to Pacific States Cast Iron Pipe Co., Provo, Utah.

100 tons, 4, 6 and 8-inch, Selah, Wash., to United States Pipe & Foundry Co., Burlington, N. J.

Unstated tonnage, 2872 feet of 12-inch class 250 water pipe, Fox Point village, Milwaukee, to American Cast Iron Pipe Co., Birmingham, Ala.

Steel Pipe Placed

Unstated tonnage, 8712 steel boiler tubes, bureau of supplies and accounts, navy department, eastern yards, to Pittsburgh Steel Co., Pittsburgh.

Unstated tonnage, 15-mile, 6-inch line, out of Lake Charles, La., for Continental Oil Co., Ponca City, Okla., to Apex Construction Co.

Cast Pipe Pending

1396 tons, 10 to 26-inch cast iron or welded steel, Vista irrigation district, Vista, Calif.; bids in.

1283 tons, 12 and 16-inch, San Francisco; bids in.

990 tons, 2 to 6-inch, Escanante, Utah; bids in.

820 tons, 8 to 18-inch, cast iron or welded steel, Vista irrigation district, Vista, Calif.; bids in.

730 tons, 6 and 8-inch, Delake district, Nescott, Oreg.; bids Dec. 6.

718 tons, Oakland, Calif.; bids in.

493 tons, 12-inch, Chicago; Lynchburg Foundry Co., Lynchburg, Va., low.

395 tons, 8, 10 and 12-inch, Enumclaw, Wash.; bids soon.

340 tons, 6 and 8-inch, Minersville, Utah; bids in.

325 tons, mostly 6-inch, with fittings, Sharptown, Md.; bids Nov. 29.

260 tons, 8-inch and under, Hampstead, Md.; bids in.

260 tons, 4, 6 and 8-inch, Port Orchard, Wash.; bids Dec. 2.

250 tons, 4, 6, 8 and 10-inch, Ridgfield, Wash.; bids soon.

250 tons, Marine City, Mich.

240 tons, 16-inch, Chehalis, Wash.; bids Dec. 2.

235 tons, 4, 6, and 8-inch; Snohomish, Wash.; bids soon.

225 tons, 4, 6 and 8-inch, Union Gap, Wash.; bids son.

203 tons, fittings, Chicago; United States Pipe & Foundry Co., Burlington, N. J., low.

175 tons, 4 and 8-inch, Huntington Park, Calif.; bids in.

154 tons, 16-inch, San Diego, Calif.; bids in.

136 tons, 2 to 6-inch, Oakley, Utah; bids in.

131 tons, 2 and 4-inch, Brigham City, Utah; bids in.

115 tons, 12 and 16-inch, Sacramento, Calif.; bids in.

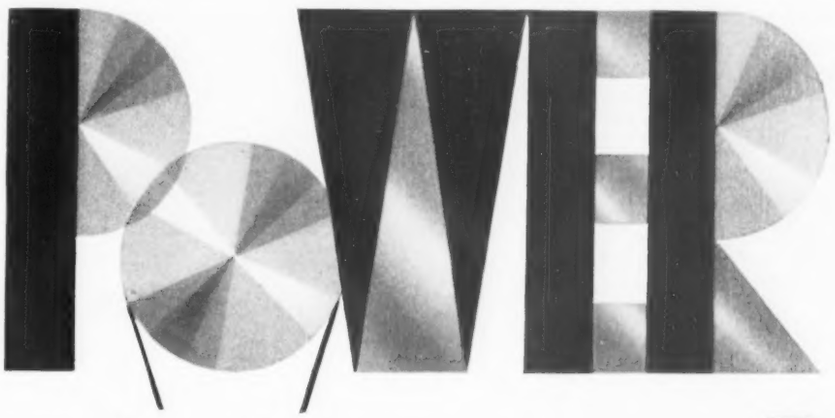
114 tons, treasury department, San Bernardino, Calif.; bids in.

108 tons, 2 to 6-inch, South Lagunda, Calif.; bids in.

100 tons, 2 to 6-inch, Cambridge, Idaho; bids in.

Unstated tonnage, 35,000 feet of 6 to 14-inch, Ispheming, Mich.; bids Dec. 3.

Unstated tonnage, Milwaukee filter plant; bids Dec. 12.



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Steel Pipe Pending

340 tons, 6-inch, Los Angeles; bids in.
269 tons, gas line, Long Beach, Calif.; bids in.

Strip Steel

Strip Prices, Page 65

Pittsburgh—Strip steel producers have virtually concluded on a price policy for first quarter since higher semifinished steel costs will soon be applied. For the balance of this quarter, however, buyers are being protected on the basis of 1.85c for hot-rolled strip steel and 2.60c, Pittsburgh or Cleveland, on cold-rolled strip.

Chicago—Strip shipments and orders are heavier, aided by increased consumption and consumers anticipating an advance. Deliveries to automotive interests are expanding and heavy shipments are looked for during the balance of the year.

Cleveland—Demand for cold and hot-rolled strip is heavier, due largely to increase in specifications from General Motors, Ford and Chrysler. Some stamping shops on automobile work are understood to be so crowded at present they are subletting orders. The Cleveland mill is operating at capacity. Shipments of cold-finished material in some instances are deferred until late in December.

Boston—Cold-rolled strip for holiday specialties is in lighter demand although operations for the district hold close to 75 per cent. An advance of $2 a ton in hot strip and $3 for cold-rolled is considered likely.

Philadelphia—Buyers of steel strip are protecting themselves against a possible advance in price, which may be announced at any time.

Youngstown, O.—Strip mills continue under heavy pressure for deliveries. The tonnage for automotive parts embraces largely hot-rolled strip, but there also is continued a good volume in medium and narrow width cold-rolled material.

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Permanent Mold ★ Semi-Permanent Mold

Wire

Wire Prices, Page 65

Pittsburgh—Definite announcement to the trade of higher prices on finished wire products was still delayed through last week, in spite of the fact that all producers had fallen in line with the $2 a ton increase in wire rods. Meanwhile, the market remains steady. A recent order for 720,000 square feet of wire fabric for New Orleans federal engineers has been increased to 1,569,000 square feet. These orders are being produced by Pittsburgh mills.

Cleveland—Since the advance of $2 a ton in wire rod prices, to $40, base, Cleveland, for common rods, and $42 for combination, an increase in wire products generally is expected, and there has been more contracting for this quarter. Specifications, however, will depend on price announcement. Consumers' actual requirements are increasing moderately, although due to their heavy stocks, nut and bolt manufacturers are not ordering as freely as the advancing rate of their own shipments would indicate.

Chicago—Wire rods have followed the $2 advance in other semifinished products, giving consumers of wire and wire products additional reason to anticipate higher prices next quarter. Consumption is well maintained.

Boston—Wire rods have advanced $2 a ton to $42, Worcester, Mass., with the likelihood of an increase on some finished wire products. Buying is brisk, notably specialties and manufacturers' wire. Electrical wire and power cable are also ahead of last year, although heavier power cable lags. Wire rope is running about 15 per cent ahead of a year ago.

Shapes

Structural Shape Prices, Page 64

New York—Bids on the west side elevated highway, Forty-third to Fifty-ninth street, Manhattan 12,500 tons, the largest project pending, were withdrawn last week, but will be readvertised shortly. About 15,000 tons are active in the metropolitan district, including schools and the Seventy-ninth street elimination project. Awards are light. More work is up for bids in New Jersey.

Five hundred tons of steel piling for the Queens approach to the Triboro bridge, New York, have been awarded Jones & Laughlin Steel Corp., Pittsburgh. This is the job which originally was awarded for German piling, and created considerable criticism.

Pittsburgh—Bids on a 510-ton through plate girder bridge in Clearfield county, Pennsylvania, are asked by the state highway department, Harrisburg, Pa., Dec. 6. Other local inquiries of interest include 600 tons in a Charleston, W. Va., bridge, on which bids will be asked some time in December.

Cleveland—While prices of plain structural shapes are strong, and producers are considering an advance for first quarter, fabricated prices in this district are unsettled again after several months' efforts to stabilize the market. Public works projects, mainly schools and grade eliminations, are maturing, from which fabricaters expect large tonnages shortly.

Chicago—Low bidders have been announced for general contracts for two bridges in this district involving 5500 tons. New inquiries generally are small individually and consist principally of state bridges. Awards are light, totaling around 3000 tons. An early pickup in orders is in prospect as a result of the fairly heavy tonnage involved in pending work.

Philadelphia—District structural activity is spotty, although award of some fair size jobs is expected shortly. Advance in shape prices for next quarter is probable, according to leading sellers.

Boston—Schools and bridges account for the majority of pending structural requirements in New England. Awards are light.

Washington—Approval has been given the past week on several hundred grade crossing eliminations for a number of states east of the Mississippi river. Structural shape fabricators have completed estimates and state there are about 45,000 tons of structural steel involved in these projects. It is expected that inquiries will be out shortly for the first of this number, to be followed by inquiries over the next ten to 12 months.

Birmingham, Ala. — Fabricating shops in Birmingham are maintaining active operations with numerous small tonnage orders being received. Bids were opened this week on the crest gates for the Warrior river lock No. 17, within "hauling distance" of the shops here, 1200 tons being involved.

San Francisco — The structural shape market is fairly active and awards totaled over 2700 tons, bringing the aggregate for the year to

Shape Awards Compared

	Tons
Week ended Nov. 23	12,209
Week ended Nov. 16	19,795
Week ended Nov. 9	21,750
This week, 1934	25,385
Weekly average, 1934	16,284
Weekly average, 1935	16,871
Weekly average, October	18,957
Total to date, 1934	777,015
Total to date, 1935	782,941

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OFFICES

CLEVELAND CHICAGO PHILADELPHIA

108,656 tons, compared with 112,493 tons for the corresponding period in 1934. Bids have been opened on 900 tons for pumping units for the metropolitan water district, Los Angeles.

Seattle—New business is developing in volume, and fabricators are working overtime on estimates. One plant reports more demand than any time since 1929. Practically all of the jobs are public works.

Shape Contracts Placed

1600 tons, state highway bridge RC 3650, Highland Lake-Fort Montgomery, Orange county, New York, to Phoenix Bridge Co., Phoenixville, Pa.; through Bronx Water Works Corp.

770 tons, bullion depository, Fort Knox, Ky., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

710 tons, beam bridges, scattered locations, Nebraska, for Chicago, Burlington & Quincy railroad, to American Bridge Co., Pittsburgh.

675 tons, bridge, Houston, Tex., to Virginia Bridge & Iron Co., Roanoke, Va.

600 tons, depressed tracks, New York Central railroad, Fifty-third to Fifty-fourth streets, Manhattan, New York, to American Bridge Co., Pittsburgh; through P. T. Cox Contracting Co.

500 tons, piling, Queens approach to Triboro bridge, New York, to Jones & Laughlin Steel Corp., Pittsburgh; through Woodcrest Construction Co.

450 tons, bridge, Ohsahka, Idaho, to McClintic-Marshall Corp., Bethlehem Pa.

405 tons, state highway bridge, 1522B, Ocmulgee river, Georgia, to Vincennes Steel Co., Vincennes, Ind.

400 tons, grillage, coke ovens, Ford Motor Co., Dearborn, Mich., to Whitehead & Kales Co., Detroit.

350 tons, state highway bridge, Laurel, Mont., to Minneapolis-Moline Power Implement Co., Minneapolis.

350 tons, sheet piling, bridge repairs, Grand Coulee dam, Washington, to Columbia Steel Co., San Francisco.

320 tons, state highway bridge, Orleans, Nebr., to St. Joseph Structural Steel Co., St. Joseph, Mo.

310 tons, postoffice, Tallahassie, Fla., to Ingalls Iron Works, Birmingham, Ala.

300 tons, cranes, American Rolling Mill Co., Middleton, O., to Harnischfeger Corp., Milwaukee.

300 tons, power house, Vineland, N. J., to Frank M. Weaver & Co., Lansdale, Pa.

280 tons, power house, New York University, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.; through Skinner Co., and Babcock Co.

275 tons, bridge, Wiggins Colo., to McClintic-Marshall Corp., Bethlehem, Pa.

255 tons, state highway bridge RC 3663, Schaghticoke village, Rensellaer county, New York to McClintic-Marshall Corp., Bethlehem, Pa.; through Donnie Briggs, Troy, N. Y.

250 tons, addition, American Medical association building, to Joseph T. Ryerson & Son Inc., Chicago.

240 tons, buildings, Liberty Sign & Can Co., Lancaster, Pa., to A. B. Rote & Co., Lancaster, Pa.

210 tons, health center, East Harlem, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; through D M W Construction Co.

210 tons, state bridge, Olean-Hinsdale, Cattaraugus county, New York, to McClintic-Marshall Corp., Bethlehem, Pa.; through William J. Knauer & Co., Attica, N. Y.

210 tons, state highway bridge, Newport, Ky., to Midland Structural Steel Co., Chicago.

200 tons, building and alterations, The Viscose Co., Parkersburg, W. Va., to Belmont Iron Works, Philadelphia.

185 tons, state highway bridge, Mineola, Long Island, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

185 tons, state highway bridge, St. Albans, Vt., to Vermont Structural Steel Co. Inc., Burlington, Vt.; through B. A. Barton Construction Co.

174 tons, state bridge, Garfield county, Montana, to Minneapolis-Moline Power Implement Co., Minneapolis.

160 tons, radio towers, navy department, Delhgren, Va., to American Bridge Co., Pittsburgh.

150 tons, overpass, Hartland, Vt., to Vermont Structural Steel Co. Inc., Burlington, Vt., O. A. Priest, general contractor.

150 tons, state highway bridge, Fairbury, Nebr., to American Bridge Co., Pittsburgh.

145 tons, 237-foot viaduct, Kearney county, Nebraska, to American Bridge Co., Pittsburgh.

145 tons, state highway bridge 1197, Clark county, Indiana, to Pan-American Bridge Co., New Castle, Pa.

140 tons, screen towers, United States army proving ground, Dahlgren, Va., to American Bridge Co., Pittsburgh.

135 tons, steel tees, schedule 6090, Mare Island, Calif., to unnamed interest.

Behind the Scenes with STEEL

Head Unbowed

ONE of our severest critics (apparently) writes from the Hudson Terminal Annex in New York, on a subscription card, postage paid by us: "Three narrow columns to the page, and advertising matter intermingled with reading matter, it tangles the eyes to try to read the magazine."

Knowing that our anonymous pal could never untangle his eyes to read this fine print, we recognize a fine opportunity to call him a few choice names, but why waste the time? That guy must have a terrible time with the telephone book.

All we can say, Mr. Hudson Terminal Annex, is that if you are correct, we know 50,000 readers with tangled eyes who must like this strange ailment.

* * *

Hear! Hear!

AMONG these 50,000 is Mr. John B. Johnston, manager of sales for Carnegie-Illinois Steel Corp. at Milwaukee, who writes: "I wish to congratulate you on your publication, as it has been a source of interest to me for several years, and I trust that you will continue the high standards now being maintained."

Thank you, Mr. J., and rest assured we will.

* * *

42 More Days

PROGRESS IN 1935 PAVES THE WAY FOR PROFITS IN 1936. This will be the theme of STEEL'S Yearbook of Industry out Jan. 6, 1936. Day by day, the outlines of this gigantic issue become clearer; it will be nothing short of breath-taking, undoubtedly the finest thing STEEL'S editors have ever turned out. We have a little 4-page folder which gives a complete picture of how the issue shapes up. Be glad to send you one if you would like to know more about this superissue.

* * *

Buy an Auto, Mister?

THE battle of words is on in the public prints. It's a great show, with first one motor maker heaving "beautiful, superb, astounding" and then another countering with "unparalleled, magnificent, startling," while a third, a fourth, a fifth and so on bombard your eyes with "stately, resplendent, colossal, terrific" and all the others.

Under this steady adjective assault, we are driven to cover in our garage, where, with a trace of a tear in her headlamps, reposes our 1930 model, quiet and a little afraid before this glittering parade of 1936 motor nymphs. We try to console her with a dab of touch-up enamel here and there where her hair is falling out; but her numerous body squeaks testify audibly to the fact that she is probably not long for this world.

* * *

Indices

INTERESTING figures on comparative costs of commodities used in construction are printed in a recent *Client's Service Bulletin* of the American Appraisal Co. On the basis of 1913 equaling 100, they are, for August:

Labor	174
Lumber	160
Common brick	188
Cement	161
Steel	**125**

On the strength of these figures, we would suggest in a meek voice, "Save by building with steel."

* * *

Tear Off Tariff

CANADIAN tariff of 5 cents per issue on magazines from this country is discarded effective Jan. 1, so our Dominion readers after that date will save $2.60 per year, and *Time* will no longer have the opportunity to print on its front cover: "In Canada, 20 cents; reason—Tariff."

* * *

Data

STEEL plant operating rates for the month of October: American Iron and Steel institute, 52.13; STEEL, 52.47. Forecast by the Institute was 50.85.

SHRDLU

125 tons, material for bridges and repairs, Baltimore & Ohio railroad, Virginia and West Virginia, to Phoenix Bridge Co., Phoenixville, Pa.

125 tons, hangar, municipal airport, Lakeland, Fla., to Ingalls Iron Works, Birmingham, Ala.

120 tons, I-beam spans, Red Willow county, Nebraska, to Omaha Steel Works, Omaha, Nebr.

100 tons, building, Ruhls Bakery, Harrisburg, Pa., to Reading Steel Products Co., Reading, Pa.

Shape Contracts Pending

4600 tons, construction of West Seventy-ninth street grade elimination and related structures, bids Nov. 22 with transit commission, New York city.

3000 tons, bridge, Hammond, Ind.; E. J. Albrecht Co., Chicago, low for general contract.

2600 tons, garage and plant addition, Sheffield Farms Co., Queens, New York.

2500 tons, Torrance avenue bridge, Chicago; Great Lakes Construction Co., Chicago, low for general contract.

1580 tons, First avenue south, overpass, Seattle; P. P. Gjarde, Seattle, general contractor.

1500 tons, pavilion, Bellevue hospital, New York.

1000 tons, incinerator plant, Detroit, for Wayne county, Michigan.

900 tons, pumping units, metropolitan water district, Los Angeles; bids opened.

800 tons, two schools, Hammond, Ind.; bids Dec. 5.

700 tons, approximately, three highway bridges, Chesapeake & Delaware canal; Wisconsin Bridge & Iron Co., Milwaukee, low.

600 tons, state bridge, Mississippi.

600 tons, bridge, Charleston, W. Va.; date of bid advertisement expected following approval of city bond issue early in December.

510 tons, through plate girder bridge, Bradford and Lawrence townships, Clearfield county, Pennsylvania; bids to state secretary of highways, Harrisburg, Pa., Dec. 6.

500 tons, postal station, Madison Square, New York; bids Dec. 5.

500 tons, state bridges, Oklahoma.

465 tons, two state bridges, North Turner and Leeds, Maine.

400 tons, bridge, Bridgeport, Ind.; Calumet Paving Co., Gary, Ind., low for general contract.

400 tons, school, Paterson, N. J.

362 tons, state undercrossing at Hobart street, Los Angeles; bids Dec. 15.

300 tons, high school, Ramsey, N. Y.

300 tons, postoffice, Huntington, W. Va.; bids Dec. 3.

270 tons, state bridge, Newbury-Newburyport, Mass.; M. McDonough Co., Saugus, Mass., low. Job also takes 475 tons of bars.

220 tons, repairs to two state highway bridges, West Virginia.

200 tons, St. Joseph's Home, Beth Ayres, Pa.

188 tons, Queen Anne bridge, Seattle; bids Nov. 27.

150 tons, state bridge, Groton, Conn.; Smith Construction Co., Derby, Conn., low.

120 tons, state crossing at Palo Alto, Calif.; bids Dec. 3.

100 tons, approximately, comprised of 173,700 pounds of plain structural steel and 25,823 square feet of steel channel bridge flooring, replacing existing bridge floor in Northumberland and Union counties, Pennsylvania; Paul E. Rarick, Zion's Grove, Pa., low at $57,908.19 on Nov. 15 bids to state department of highways, Harrisburg, Pa.

Reinforcing

Reinforcing Bar Prices, Page 65

New York—Several of the larger reinforcing tonnages, pending several weeks, have been placed. Included are 1550 tons for the Manhattan approach, Triboro bridge, which went to Fireproof Products Co. A fair volume of new work is coming out for bids, mainly public projects.

Chicago—Action remains to be taken on several building projects involving large lots of reinforcing bars. Orders recently have been light, while new inquiries involve few projects taking more than 100 tons. Chicago sanitary district has taken bids on 750 tons for an Oak Park sewer, with 1700 tons involved in additional work on which new bids are to be asked. A large tonnage is pending for state bridge and road building.

Pittsburgh—Large tonnages of bars and bar mats for Pennsylvania

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state highway work features the market. In the Nov. 15 letting, Donora Construction Co., Donora, Pa., is low at $471,150.57 on Allegheny county work requiring 208,567 pounds of plain steel bars. Another large reinforcing steel inquiry is for 600 tons at Binghamton, N. Y., for an Erie railroad grade crossing, on which bids will be taken in mid-December. Plain reinforcing bars remain quoted 2.05c in carload lots, cut lengths, by distributors.

Boston — Buying of reinforcing steel has declined, but inquiry is heavier. Small-lot orders are fair and on this type of business prices are steady. About 1000 tons are up for bridges on which bids are in.

Philadelphia — Concrete bar awards are light, although a substantial tonnage is pending. Bids for the federal housing project in Atlantic City, N. J., involving 600 tons, have been rejected.

San Francisco—Awards aggregated less than 500 tons, bringing the total for the year to 197,597 tons, compared with 95,838 tons for the same period in 1934. The majority of the awards were confined to lots of less than 100 tons. Pending business, however, exceeds 32,000, most of which, it is expected, will be placed within the next two weeks.

Seattle—Demand is improving rapidly and more tonnage is pending or up for figures than in many months. Federal and state building is active, but tonnages are not large, averaging from 20 to 50 tons each. Washington has awarded two bridge jobs, the First avenue south, Seattle, overpass to P. P. Gjarde, Seattle, requiring 690 tons, while the Nisqually bridge went to Rumsey Construction Co., Seattle. The latter calls for 1042 tons.

Concrete Awards Compared

	Tons
Week ended Nov. 23	**4,935**
Week ended Nov. 16	**3,640**
Week ended Nov. 9	**17,916**
This week, 1934	**1,697**
Weekly average, 1934	**4,084**
Weekly average, 1935	**7,039**
Weekly average, October	**7,383**
Total to date, 1934	**203,724**
Total to date, 1935	**330,859**

Reinforcing Steel Awards

1980 tons, intercepting sewer in connection with Wards Island disposal plant, New York; 600 tons to Kalman Steel Corp., Bethlehem, Pa.; 600 tons to Concrete Steel Co., New York; 500 tons to Igoe Bros., Newark, N. J.; 280 tons to Truscon Steel Co., Youngstown, O.; through Rosoff Bros.

1550 tons, Manhattan approach, Triboro bridge, contract 48, New York, to Fireproof Products Co., New York; Corbetta Construction Co., New York, general contractor.

350 tons, track depression, New York Central railroad, Manhattan, New York, to Concrete Steel Co., New York; through George J. Atwell Foundation Corp.

240 tons, state bridge, Beaverbrook, Waltham, Mass., to Morrison-Stevens Co., Boston; H. L. Hauser & Co. Inc., Boston, general contractor.

232 tons, store, Sears-Roebuck Co., Nashville, Tenn., to Wilson-Weesner-Wildinson Co., Nashville; through Rock City Construction Co., Nashville.

200 tons, foundations for oil storage tanks, Chelsea, Mass., to Kalman Steel Corp., Bethlehem, Pa.

165 tons, bars and shapes, factory building, Behr-Manning Corp., Watervliet, N. Y., 85 tons bars to Albany Iron & Steel Supply Co., Albany, N. Y., 80 tons structurals to West Side Structural Steel Co., Watervliet, N. Y.; Morton C. Tuttle Co., Boston, general contractor.

118 tons, state highway work in Solano and Contra county, California, to unnamed interest.

100 tons, state highway work in Eureka county, Nevada, to unnamed interest.

Reinforcing Steel Pending

9128 tons, placing, specification 644, Imperial dam, Yuma, Ariz.; bids opened.

8325 tons, schedule 6-P and 7-P, metropolitan water district, Los Angeles; bids Dec. 10.

3241 tons, wash siphons, All-American Canal System, Yuma, Ariz.; bids opened.

1042 tons, state bridge, Nisqually river, Washington; Rumsey Construction Co., Seattle, general contractor.

1000 tons, reservoir, Denver; bids Nov. 27.

755 tons, pumping units, specification 132, metropolitan water district, Los Angeles; bids opened.

750 tons, sewer, Oak Park, Ill., for Chicago sanitary district.

690 tons, First avenue south, overpass, Seattle; P. P. Gjarde, Seattle, general contractor.

625 tons, El Cerrito crossing, Alameda county, California, for state; general contract to J. F. Knapp, San Francisco.

593 tons, sewer project, Baltimore, bids in.

550 tons, bridge, Hammond, Ind.; E. J. Albrecht Co., Chicago, low on general contract.

500 tons, state underpass at Newport, Ky.; J. C. Codell Construction Co., Winchester, Ky., general contractor.

390 tons, state crossing at Calwa, Fresno county, California; bids Dec. 4.

360 tons, garage and plant addition, Sheffield Farms Co., Queens, New York; bids in.

310 tons, sewage disposal plant, Appleton, Wis.; bids Dec. 6.

246 tons, Unity dam, Oregon; bids to reclamation bureau, Vale, Oreg., Nov. 30.

220 tons, sewage disposal plant, New Brunswick, N. J.

192 tons, comprised of 208,567 pounds of plain steel bars for Jefferson township, Allegheny county, and 176,059 pounds for McCandless and Pine townships, Allegheny county; Donora Construction Co., Donora, Pa., low at $471,150.57 on the former item, and General Asphalt Paving Co., Canton, O., low at $599,792.57 on the latter tonnage.

142 tons, Pennsylvania state highway letting for Dec. 6, consisting of the following individual projects: 205,180 pounds for Clearfield county, 65,270 pounds, Lycoming county, and 24,480 pounds, Northumberland county.

131 tons, reclamation projects in Washington, Idaho and Wyoming; bids Dec. 2.

116 tons, state crossing at Palo Alto, Calif.; bids Dec. 3.

100 tons, bars and channels, 1,000,000-million gallon reinforced concrete reservoir, Amesbury, Mass., Pasquale Contracting Co., Jamaica district, Boston, Mass., general contractor; bids Nov. 5.

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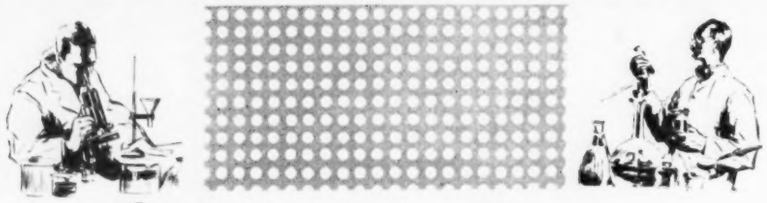

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Pig Iron

Pig Iron Prices, Page 66

Pittsburgh—No sizable sales have been made at the advanced prices, and it appears doubtful that any test will be made before Jan. 1. November and December shipments will probably be the heaviest for any two months in 1935. Requirements of a nonintegrated steelworks in Kentucky are now being furnished by a Pittsburgh seller.

Cleveland—Pig iron shipments are increasing faster in the last half of November than in the first half, as melters are accumulating stocks. For the first half the gain over the comparable period in October was 15 per cent, and producers now indicate that specifications will show a larger increment for the last half of this month. Books will be opened Dec. 2 for first quarter at present prices. Current sales are relatively small as users contracted freely prior to the recent advance of $1 a ton.

Chicago—Producers continue more concerned with shipments against old orders than in soliciting new business, since most consumers are covered at least through the balance of this year. Foundry operations are well maintained, with some further gains apparent among suppliers of automotive castings. Tractor manufacturers also hold to active schedules, while farm implement manufacturers, in some cases, have started the building of spring tools. The $19.50, furnace, market on No. 2 foundry malleable is tested by only occasional spot purchases.

Boston—At Boston last month 833 tons of Indian iron arrived, while thus far this month 1100 tons of Indian has come in, also 2400 tons of Dutch at Boston and Providence, R. I. While the bulk was sold on arrival, some went into storage. Domestic producers outside this district are also arranging stocks for quick New England delivery. Meanwhile, buying is light, with domestic brands dragging, although prices are firm on iron to be shipped before Dec. 31. Foundry melt climbs gradually, notably producers of machine tool castings.

Philadelphia—Activity is restricted largely to specifications against contracts placed last month. Alan Wood Steel Co. has booked 200 tons of foundry iron for the navy yard at Mare Island, Calif.

New York—Foundry melt has slowed down, and doubt is expressed as to whether there will be much further gain this year. Should this prove to be the case, considerable iron will be carried over into next year. Some leading interests expect to have at least two months supply on hand at the year-end. Shipments are holding up fairly well, with an increase probable in the closing weeks of the year, as specifications against contracts made in October, prior to the price advance, have to be acted upon by Dec. 31.

Youngstown—Stocks of No. 2 foundry and malleable continue steadily to dwindle as foundries' needs embrace expanding tonnages. Books for first quarter deliveries will not be opened until early next month. It now is suspected that some of the current buying is anticipatory of a possible additional $1 advance in price in nearby months.

Buffalo—Shipments this month will equal those of any similar period of the year. Producers have chartered all available barges, and it is expected that close to 20,000 tons will have been moved eastward at the end of this month. Melt appears to be increasing steadily.

Cincinnati—The new prices are declared firm, without test, current buying being in small lots by melters who failed to cover needs at lower quotations. Shipments are near Oc-

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tober levels, with the expectation that tonnage for December will be more than doubled to cover contracts with a large percentage going into inventory.

St. Louis—A slight tapering is noted in shipments. So far this month, however, there is a substantial gain over the comparable period in October. New buying is light. Business of stove foundries in October, according to final reports, was about double that of a year ago, and approximately 15 per cent larger than in September.

Birmingham, Ala.—Steady shipments, the blowing in of two additional furnaces, and increased output bespeak continued strength in the market. Woodward Iron Co. has blown in a blast furnace and the Republic Steel Corp. will bring in one Tuesday or Wednesday, making 11 active. Production this month will probably go above 135,000 tons. Spot business predominates.

Toronto, Ont.—Expanding business is having a stimulating effect on demand. Sales, increasing steadily since Sept. 1, are now running 800 to 900 tons weekly. Although no announcement has been made, some melters anticipate a price advance, and the past few days a few orders have been booked asking for rush delivery prior to higher prices.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

Higher prices on bolts, nuts and rivets are expected to be announced soon as a result of the recent advance of $2 on wire rods. Most consumers are protected by contracts for the current quarter.

At Cleveland, the volume of specifications from automobile manufacturers is about equal to that in midsummer. Nut and bolt manufacturers are reducing their stocks considerably. Demand from railroads, jobbers and miscellaneous sources is relatively light.

Railroad buying in the Chicago district has held the volume of business to the improved level reached in October and the outlook is for continuance.

Scrap

Scrap Prices, Page 67

Pittsburgh—Firmness dominates the scrap market, finding many brokers rueful of their recent short orders. Apparently anticipating higher scrap prices many brokers have been bidding as much as they obtained in recent sales to consumers. The market is further tightened by the active direct solicitation by a leading consuming interest on tonnages of scrap in the hands of primary holders.

Cleveland—Iron and steel scrap has grown so scarce in this district that dealers are offering 25 cents more to obtain coverage and are not successful in attracting tonnage. A local mill has taken some railroad heavy steel at close to $13, and the heavy melting price here has advanced to $12.25 to $12.75 for No. 1. Pressed sheets and low phos punchings have advanced 25 cents. Considerable tonnages of No. 2 heavy melting are reported to have been taken by Youngstown district consumers.

Chicago—Scrap is strong and prices have advanced further. While heavy melting steel was sold recently at $13.50, brokers are paying as high as $13.75 and with sellers unable to pick up this grade at less than $13.50, mill bids of the latter figure are being refused and the market may be quoted $13.50 to $14.

Boston—More active export trade has had a tendency to firm scrap prices, notably heavy melting steel. During the last 10 days about 13,000 tons has been shipped and buying for another cargo at $9.75 dock, for No. 1 and $8.75 for No. 2 continues. New England consumers of steelmaking grades are not following export prices, but are picking up slightly more material at a $1 a ton or more lower.

New York—Buying and shipments of steel and iron scrap are light and export volume to Italy has decreased while to England and Japan it is moderate. Shippers are paying $8.25 on cars for eastern Pennsylvania delivery for No. 2 heavy steel. Prices are generally firm with moderate advances in No. 1 machinery cast and skeleton steel.

Philadelphia—Prices of steel and iron scrap are unchanged except for an advance of 50 cents per ton on specification pipe. A fair tonnage of No. 2 heavy melting steel has been covered at the going market. Shipments of heavy melting steel have been resumed to Coatesville, Pa. It is reported the Standard Steel Works, Burnham, Pa., has purchased the compressed sheets on which Edward G. Budd Mfg. Co., Philadelphia, recently opened bids.

Buffalo—Iron and steel scrap dealers are marking time while mills absorb the heavy November deliveries of material by water. There is no open market for scrap save some small sales of No. 2 heavy melting steel reported to have been made to a local melter at $10.75. Prices are nominal on most grades and have a quiet undertone of strength.

Detroit—No. 1 heavy melting steel, hydraulic compressed sheet scrap, and machine shop turnings have declined 25 cents a ton in the local market the past week. The market preserves a strong undertone, but heavy local offerings are a feature.

Cincinnati—The recent increase in pig iron prices so far has had no effect on scrap quotations. Considerable railroad scrap from offerings this month will come into this district, part for application on contracts.

St. Louis—The market for iron

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and steel scrap continues strong, in face of slack buying. Considerable stir has been created among dealers by movement of heavy melting steel from this area to Chicago and other eastern consuming points.

Birmingham, Ala.—While trade has improved a little with blast furnace activity, iron and steel scrap market conditions are still below expectations of dealers. Quotations are firm.

Seattle—Firmness of domestic prices is sustaining the scrap market in the continued absence of foreign buying. Japanese importers are not placing new business but casual inquiries indicate they are expecting a break in prices. There is no such indication at present and exporters are content to sell to local consumers.

Toronto, Ont.—Demand for iron and steel scrap is at a good level with sales close to the peak for the year. Foundries are taking regular shipments of iron grades, and orders generally are running to better tonnages than formerly. Prices are firm and unchanged with possibilities of advances in some lines soon.

Warehouse

Warehouse Prices, Page 68

Pittsburgh — Following the expected announcement of higher mill prices on steel, jobbers here will doubtless adopt a similar policy, although it may be delayed until first quarter. Specifications and shipments are at rates similar to those in October.

Cleveland—Demand is slower, the week's volume being less than in the preceding week, and the total for the month to date slightly below that in the comparable period in October. Prices are steady.

Chicago — While sales compare favorably with the rate a year ago, the tendency continues slowly downward. A moderate decrease from the rate of the past several months is shown for November.

Boston—Sales are holding up well, and orders are diversified as to products. Prices are firm. Maine district jobbers are benefiting materially from small, but frequent purchases of material for the tidal power project at Eastport, including merchant steel welded pipe. Prices on some of these bids show considerable variation.

Cincinnati—A pickup during the past week bucks seasonal trends. Industrial ordering is more frequent, although individual sales show unchanged volume.

St. Louis—Warehouse business in the immediate past has developed moderately slackening tendencies, accountable for mainly by seasonal influences. Railroad buying has been active mainly for shapes and other materials for bridge and general repair. Coal mines and packing houses have also increased their buying. Talk of advanced prices has assisted business as a whole.

Semifinished

Semifinished Prices, Page 65

The wire rod market was advanced $2 a ton last week by practically all producers who named the effective date for the increase "at once." The advanced market, therefore, is $40, Pittsburgh or Cleveland, and $41, Chicago, for common wire rods, with combination rods $2 a ton higher. Although this increase will apply on all spot business, shipments continue at a fairly heavy rate against fourth-quarter contracts at the former level.

Sheet bars are quoted $30, base, all seven basing points, on all new business, representing the recent $2 a ton increase; whereas billets, blooms, and slabs at seven basing points are quoted $29 for rerolling billets, and $35 for forging quality.

Republic Steel Corp. has announced a change in extras on forging billets, effective immediately. Under the new classification forging billets are described as squares not less than 4 x 4-inch with a maximum radius for rounded corners of 3/16-inch or fraction thereof of nominal cross sectional dimension; rectangular sections other than squares, minimum thickness 2 inches, minimum cross sectional area 16 square inches. The extra for size on forging billets under 5 x 5-inch down to 4 x 4-inch inclusive or slabs of equivalent sectional area with minimum thickness not less than 2 inches, is $4 per gross ton over the forging billet base.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh—The policy of the tin plate producers on the question of the 1936 contract price is still uncertain. On one side, nonintegrated mills are favoring an increase, but on the other hand, there is considerable opinion to the effect that the present $5.25 per base box market should be carried over unchanged. In the meantime, the average of operations among tin plate producers is fractionally lower at 65-70 per cent, though a leading interest operated through last week at 74 per cent.

Youngstown, O.—Tin plate mills in this district are steadily adding to

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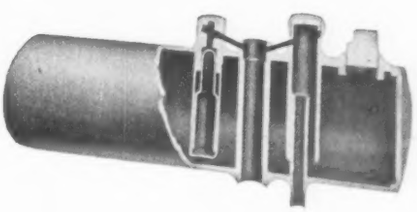

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deferred deliveries under further pressure by consumers. These include a wide list of users, from beer canmakers to miscellaneous products. All this is puzzling to mill managers, who have been awaiting a lull in order to continue mill repairs during the expected dull season. Prices for the new season have not yet been announced. Feeling in this district is that they may be continued at present levels.

Steel in Europe

Foreign Steel Prices, Page 68

London — (*By Cable*)—All departments of the steel and iron industry in Great Britain are active and some works are withdrawing from the market, with output sold as far ahead as deemed advisable. Prices of pig iron have been advanced in the Middlesbrough area. Output of semi-finished steel is inadequate to meet demand of manufacturers and increased Continental imports are supplementing the domestic supply. The Southern railway has placed orders for 10,000 tons of rails and fastenings and South Africa has placed a substantial contract for steel tubes.

Foreign trade in October showed a gain over September. Exports of steel and iron products in October were 224,033 tons, compared with 187,153 tons in September, a gain of 36,880 tons; imports in October were 101,221 tons, compared with 89,309 tons in September, a gain of 11,912 tons.

The Continent reports export trade is fairly satisfactory and buying by British interests is developing.

Metallurgical Coke

Coke Prices, Page 65

Most by-product coke producers in the Pittsburgh district are now diverting a larger share of their output for the domestic market. Contract covering the by-product coke requirements of a leading consumer in the Pittsburgh district has recently changed hands and now shipments are proceeding from the plant of a merchant pig iron producer, whereas this was formerly supplied by an integrated Pittsburgh steel mill.

Nonferrous Metals

Nonferrous Metal Prices, Page 66

New York—Copper, lead and zinc maintained steady prices last week while shipments to consumers continued at a satisfactory rate. Antimony and tin weakened.

Copper—Outlook remained promising with pickup in fresh buying expected for early in December. Bids submitted in connection with the navy awards, totaling 460 tons of grade "A" copper ingot, were on a basis of 9.25c, Connecticut. This development gave the market a strong undertone.

Lead—Sales continued active with purchases made to cover actual requirements. Prices held unchanged at 4.35c, East St. Louis, and 4.50c, New York, with St. Joseph Lead Co. still obtaining $1 premium per ton on the latter market.

Zinc—A moderate pickup in sales was recorded with the price tone slightly stronger. Most producers continued to quote prime western at 4.85c, East St. Louis, but several sellers still asked 4.95c. A moderate buying pickup would stiffen prices quickly, it is believed.

Tin—Prices weakened last week with closing levels on Straits spot around 51.00c. Consumer demand continued light with supplies tight.

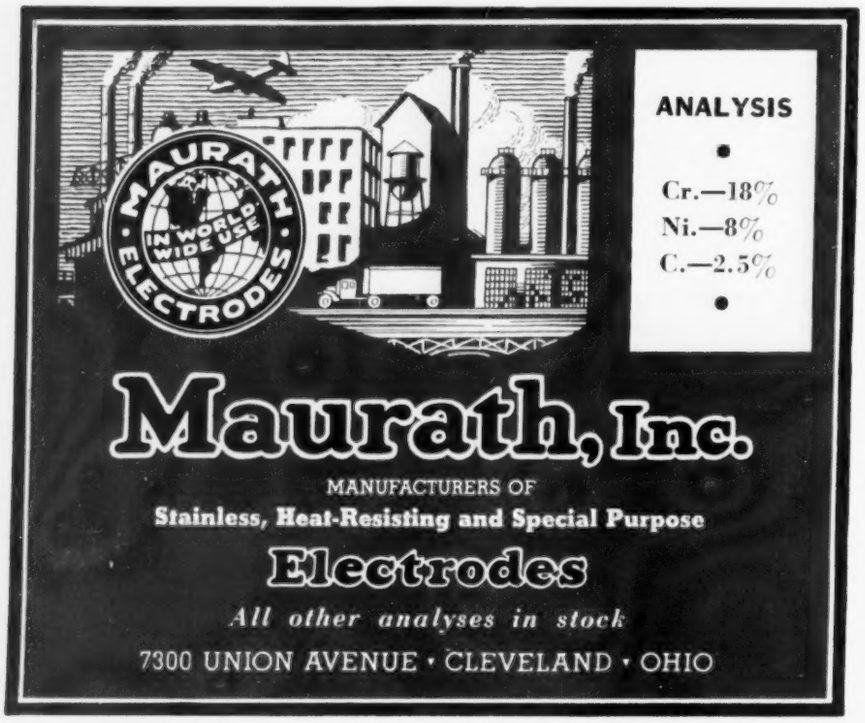
Antimony — American antimony prices declined to 13.75c on weakness in the Chinese market in China. Chinese spot here dropped nominally to 14.00c, duty paid New York.

Iron Ore

Iron Ore Prices, Page 67

Cleveland—Shipments of iron ore from upper lake ports will terminate for the season this week, and preliminary estimates indicate the total will amount to 28,000,000 tons for the year, a gain of about 26 per cent over 1934. The Lake Superior Iron Ore association's statement of consumption in October, and stocks on hand follows:

	Tons
Consumed in September	2,654,278
Consumed in October	2,917,059
Increase in October	262,781
Consumed in October 1934	1,306,477
On hand at furnaces Nov. 1, 1935	29,756,346
On Lake Erie Docks Nov. 1, 1935	5,358,668
Total at furnaces and Lake Erie docks Nov. 1, 1935	35,115,014
Total Nov. 1, 1934	36,308,028



Inventory Tax Varies With Local Rates

A number of inquiries have come to STEEL in regard to the statement published on page 71 of the Nov. 18 issue, to the effect that the year-end inventory tax on some products runs as high as $2.40 a ton and was deterring some buyers.

In Ohio, for example a tax return is required at the close of the year giving the value of inventories each month. The taxable value then is averaged for the year by dividing the total amount by 12. If, however, the consumer carries no inventories for 11 months, but acquires a large stock in the twelfth month, this is the amount on which his tax is computed.

The actual tax then is based on 50 per cent of this value, for resident taxpayers, and 70 per cent of true value in the case of nonresidents. The tax levy varies with different

cities. In Cleveland, the tax rate is 29.9 mills, or 2.99 per cent. On a product in stock at the close of December, valued at $200 the tax, therefore, would be based on 50 per cent of this value, making it $2.99. Some consumers have been operating with low stocks, or hand-to-mouth through most of the months in 1935.

A similar tax on inventories, which is generally classed as a property tax, is in effect in many other states. Actual taxes vary according to local tax rates.

Equipment

Boston—Machinery and equipment orders are well sustained, inquiry brisk, with most of the larger shops operating full-time schedules. This is especially true in the Worcester and Providence districts. Delivery dates on new business have been extended, notably for heavier types of machinery which are more active. Machinery shops are buying more steel and castings. Additional government business which has been pending several weeks has been placed with New England builders.

New York—Machinery buying is well diversified as to light and heavy equipment, incoming volume holding to the recent rate with dealers representing the larger shops figuring considerable business. Crane inquiry has improved materially during the last two weeks and the demand for small tools has kept pace with automatic production units, mostly of the latest development.

Chicago—Equipment buying is in steady or improved volume. Machine tool demand is only fair, having yet to rebound to the late-summer rate, but prospects are regarded as favorable. Good activity still prevails in small tools. Steel mills are busier in repairs and improvements to producing facilities than they have been in several years. Details are lacking on the rod mill which, it is heard, the United States Steel Corp. will build in this district. Harnischfeger Corp., Milwaukee, has been awarded the cranes for the American Rolling Mill Co.'s new mill at Middletown, O.

Seattle—Machine tools are in improved demand while mining equipment is moving in better volume than usual at this season. Weather conditions have reduced logging operations and buying by lumber plants is reduced because of uncertain conditions.

Quicksilver

New York—Quicksilver prices are strong and little changed from a week ago. Small lots are quoted $75.50 a virgin flask of 76 pounds. Demand is light.

Construction and Enterprise

Ohio

CLEVELAND—Universal Metal Sections Co. was incorporated Nov. 1 by George R. Doughty, N. D. Weyrick, and Newman Sam Price, Price & Price, Leader building, attorney. Decision on a plant has not yet been made.

CLEVELAND—Aluminum Industries Inc., 2438 Beekman street, Cincinnati, has purchased the Dall Mfg. Co. Inc., Cleveland, manufacturer of cast iron pistons, to meet demands upon it for cast iron piston equipment for automotive and industrial use. Manufacturing operations will be continued at the Cleveland plant.

EUCLID, O.—This city (suburb of Cleveland) plans waterworks improvements and has applied for PWA aid. Cost is $1,500,000. E. W. Bailey is city engineer.

KINSMAN, O.—Glauber Brass Mfg. Co., 7706 Platt avenue, Cleveland, has begun construction of a brass foundry plant in this city. O. L. and F. D. Prier are president and treasurer of the company, which will manufacture bathroom and kitchen sink fixtures, valves, brass pipe fittings, and other supplies. The Glauber company has recently purchased the Rickersberg Brass Co. plant at Cleveland, and machinery from both plants will be moved here, although it is planned to operate one of the Cleveland plants part time.

LAKEWOOD, O.—The city will spend $80,000 some time after the first of the year on a new building for Lakewood hospital. The building will house the heating system of the hospital, located at 14519 Detroit avenue, as well as the laundry facilities and refrigeration machinery.

MANSFIELD, O.—Mansfield Vitreous Enameling Co., Mansfield, has been purchased by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. It is reported that Westinghouse will spend a large sum on improvements.

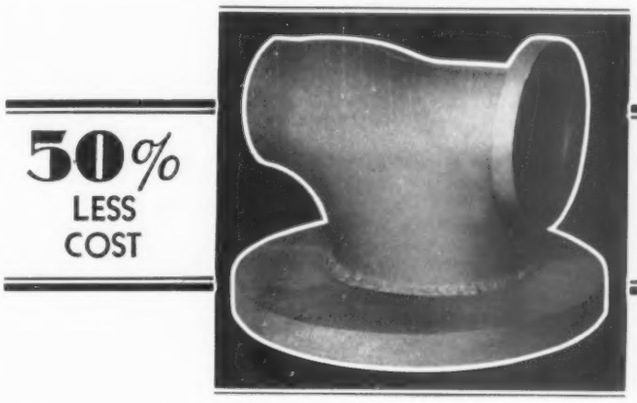
YOUNGSTOWN, O. — Youngstown Sheet & Tube Co. will spend $1,000,000 in the near future at its Campbell plant, for moving and consolidating machine shops and rounding out of various facilities, including additional finishing equipment for the new mills.

Illinois

CHICAGO—H. M. Harper Co., 2620 Fletcher street, soon lets contract for nut and bolt manufacturing plant, to cost $35,000. R. D. Huszagh, 6 North Michigan avenue, is architect.

CHICAGO—Owl Electric Co., 3401 Ogden avenue, has been incorporated by William H. Becker, Kernal Freeman, and Bernard L. Becker, to do a general electric contracting, construction and engineering business. Correspondent is W. H. Becker, 1 North LaSalle street, Chicago.

CHICAGO—Sanitary District of Chicago will receive bids Dec. 5 at room 600, 910 South Michigan avenue, for southwest sewage treatment works, divisions I, J, K, and L. Project includes steam turbine driven generator units, condensing equipment for these units,



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feedwater heating equipment, and power transformers. Delivery will be to southwest sewage treatment works, Stickney, Cook county, Illinois.

LEMONT, ILL.—Negotiations are now being made for the opening of a factory on the present site of the Aluminum Products Co., which will manufacture cooking utensils from stainless steel, and other metal specialties.

Michigan

DETROIT—Directors of Parker Rustproof Co., Milwaukee avenue, East, and Dubois street, Detroit, have authorized a consolidation of the Metal Finishing Research Corp., Detroit, with the Parker company. A meeting to ratify the proposal will be held on Dec. 5.

DETROIT—Electronic Control Corp., 2832 East Grand boulevard, Detroit, recently was incorporated to manufacture electronic equipment for heat treating, sound measurement, weld and flaw inspection, and automatic control. R. A. Powers is vice president.

JACKSON, MICH.—Walker Jackson Co., Racine, Wis., has filed articles of incorporation, and has purchased the Hupp factory, Hupp avenue, Jackson, Wis., which has a floor space of some 150,000 square feet. Machinery is being installed for the manufacture of automobile parts and accessories. Directors of the concern are Willard T. Walker, Warren H. Walker, and M. H. Lundberg.

MT. PLEASANT, MICH.—Simrall Pipe Line Co. plans construction of welded steel pipe line from Crystal oilfield district, Montcalm county, Michigan, to Toledo, O., for crude oil transmission to refinery of Standard Oil Co. of Ohio. Line is to be built under direction of Franklin Tool Co., Mt. Pleasant, and includes series of pumping and booster stations. Cost is $1,200,000. C. L. Maguire is president.

Indiana

GARY, IND.—American Sheet & Tin Plate Co. will start construction of a new $7,500,000 mill here Jan. 1, for the manufacture of tin plate. This is a part of the $71,000,000 appropriation which the United States Steel Corp. is spending for repairs to and modernization of plants all over the country. Gary's share in the corporation's current spending program approximates $41,500,000, with the major portion of this sum reserved for the expansion and modernization of sheet mill facilities.

PENDLETON, IND.—Pickett Machine shop is being rebuilt and enlarged, for the complete overhauling and repair of machinery.

PORTLAND, IND.—Acme Electric Co, Inc., Portland, will soon take bids on construction of a hydroelectric power plant, including central power plant, 9 miles of transmission lines, and diesel power generators. Cost is $500,000. PWA funds have been applied for.

SOUTH BEND, IND.—South Bend Foundry Co., Indiana avenue and Lafayette boulevard, suffered fire loss recently to a shed, two automobile trucks, and a machine shop.

New York

BUFFALO—American Radiator Corp., Rano street, plans altering its Rano factory with cost to exceed $28,500. Maturity in the spring.

BROOKLYN, N. Y.—United Metal Box Co., 473 President avenue, plans altering former Royal Metal Furniture Co. plant, 160 Seventh street. Cost will exceed $28,000 with equipment. Property has been acquired.

ELMIRA, N. Y.—Elmira Industries Inc., recent purchaser of the former Willys-Morrow Co., has begun the buying of materials and tools for its renovation program. A. C. Schaefer is engineer of the new concern, and will announce later the date of production and the type of products to be manufactured.

LOCKPORT, N. Y.—Bids will be taken Dec. 2 for a new municipal incinerator plant in this city. Cost is estimated at $60,000. Nussbaumer & Clark, Buffalo, engineers, have plans for the job.

MAYBROOK, N. Y.—Bidders information may be examined at office of village clerk, municipal building, for construction of a sewerage development. Bids are asked for Dec. 2. Henry W. Taylor, 11 Park place, New York, is consulting engineer.

NIAGARA FALLS, N. Y.—City will open bids Dec. 6 for intake lines for its filtration plant. An appropriation of $140,000 is available for the work.

PERRY, N. Y.—A 750,000-gallon steel tank and standpipe will be erected by this village at a cost of $40,000.

SCHENECTADY, N. Y.—Plans have been approved by New York state department of health, and application for PWA loan and grant has been made for major additions and remodeling of Schenectady sewage treatment plant. Estimated cost is $221,000. Morris M. Cohn is sanitary engineer of Schenectady department of public works.

Pennsylvania

MARCUS HOOK, PA.—Plans have been drawn up by the Ballinger Co., 105 South Twelfth street, Philadelphia, for Viscose Co., Post road, for power house, including turbines and generators. Cost is $1,225,000.

PITCAIRN, PA.—Pennsylvania railroad has awarded a contract to Rust Engineering Co., Pittsburgh, for the construction of a new car shop here. Cost is estimated at $50,000.

READING, PA.—Beryllium Corp. of New York, manufacturer of chemicals, moves into the former plant of the Temple Malleable Iron & Steel Co. sometime this month. The new plant will be used for the manufacture of the above corporation's copper alloy.

Connecticut

MILFORD, CONN.—City plans electric pumping station for new sewage treatment plant for which $207,450 for entire project has been secured through federal aid. Bids will be taken soon.

District of Columbia

WASHINGTON—Panama canal, general purchasing officer, takes bids Dec. 5 for schedule 3106, covering steel channels, steel bars and flats, steel plates, plate zinc, sheet lead, copper sheets, copper-nickel alloy, bar copper, brass rods, seamless copper pipe, seamless brass pipe, and chain hoists.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids Dec. 3, schedule 6479, for miscellaneous nails, steel, and wire; schedule 6489, for miscellaneous steel wheelbarrows; schedule 6458, for miscellaneous tread, ladders, and aluminum alloy; Dec. 6, schedule 6468, for miscellaneous sextants. Delivery on the last item will be to Washington.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids Nov. 29, schedule 6467, for one heavy duty lathe with motor driven engine; schedule 6444, for miscellaneous insulated electric cable which will be delivered to Brooklyn, N. Y., and Mare Isand, Calif.; schedule 6522, for miscellaneous alloy steel forgings which will be delivered to Newport, R. I.

Virginia

BERRYVILLE, VA.—Bids will be received Nov. 30 at the clerk's office for proposed construction of sanitary sewer system. J. B. McCrary Co. Inc., Atlanta, Ga., is engineer, and H. B. Harris is mayor.

CRAIGSVILLE, VA.—Board of supervisors of Augusta county will receive bids Dec. 2 at the county court house, Staunton, Va., for furnishing and erecting a 100,000-gallon water storage tank at Craigsville. Wiley & Wilson, Lynchburg and Richmond, Va., are consulting engineers. It is a PWA project, Docket No. 1140.

GLOUCESTER, VA. — Gloucester sanitary district, No. 1, votes Dec. 16 on $18,700 bonds for constructing water works system; total cost, $34,000. R. P. Gray is chairman of board of supervisors.

LYNCHBURG, VA.—City, R. W. B. Hart city manager, has approval of PWA grant of $279,000 for Pedlar aqueduct, replacing with metal pipes from James river to College hill filtration plant; in addition, city will probably vote on $341,000 bonds.

Missouri

CUBA, MO.—City receives bids Dec. 2 for complete sanitary sewer system, flush tank, manholes, activated sludge type disposal plant with sludge drying bed, costing $33,000. C. B. Belden is mayor. George E. Wells Inc., 420 Security building, are engineers.

KANSAS CITY, MO.—Walden Furnace & Stove Co. has been incorporated by J. D. Whitcraft and Robert Walden, 11328 East Fifteenth street.

KANSAS CITY, MO. — Panhandle Eastern Pipe Line Co., 101 West Eleventh street, soon proceeds with plans and surveys for welded steel pipe line from Dana, Ind., to Detroit. Line will be about 300 miles long, construction to begin early in 1936, with completion by July. Cost about $9,000,000. In addition Panhandle Co. plans improvement in present pipe line from Texas fields to Dana, including new welded steel pipe and reinforcement work. Cost over $5,000,000. Panhandle is a subsidiary of Columbia Oil & Gas Corp., both being controlled by Columbia Gas & Electric Co., New York.

OAK GROVE, MO.—City voted $10,000 bonds to cover one-fourth of cost of sewer; town applied for $30,000 PWA funds; work to start about Dec. 1 for $60,000 water project.

OVERLAND, MO.—Overland sanitary sewer district, St. Louis county, votes Dec. 3 on $175,000 bonds for constructing sanitary sewers and sewage treatment plant. M. J. Mohan, 2512 Marion avenue. Cost will be $310,000. Engineers are Kinsey Engineering Co., 20 South Central, Clayton, Mo.

ST. LOUIS—Emerson Electric Mfg. Co., 2018 Washington avenue, has leased major portion of two-story build-

(*Please turn to Page* 86)

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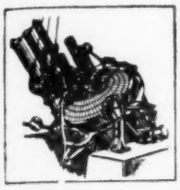

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(*Concluded from page* 84)

ing, northeast corner of Theresa and Chouteau avenue, for warehouse.

Arkansas

CHARLESTON, ARK.—City filed plans with M. Z. Blair, state sanitary engineer, for building reservoir, filter plant, tank and tower and distribution system for water works and sanitary sewer and disposal plant.

Oklahoma

SULPHUR, OKLA.—City plans sewage disposal plant and has voted on $55,000 bonds. F. F. Whitlock is engineer.

WYNNEWOOD, OKLA.—City receives bids Dec. 13 for $65,000 power plant.

Texas

GONZALES, TEX.—S. M. Ainsworth, mayor, plans power and light plant, including built-up diesel electric units, power house, cooling towers, poles, transformers, meters, etc., costing $185,000. Application to PWA for loan and grant. Garrett Engineering Co., Box 1726, Houston, Tex., is engineer.

CORPUS CHRISTI, TEX.—A. Noakes Machine Co. has been incorporated with a capital of $10,000, by A. O. Noakes Sr. and Herbert Noakes.

DENISON, TEX.—General E. M. Markham, chief of army engineers, is making a detailed survey preparatory to beginning work on Denison dam, Red River, on the Texas-Oklahoma border. Cost of project is $40,000,000.

HOUSTON, TEX.—Cook Heat Treating Co., Los Angeles, acquired site on Navigation boulevard for erection of a $35,000 plant.

Wisconsin

APPLETON, WIS. — Municipality takes bids soon after Dec. 1 on sewage disposal plant costing $700,000. Greeley & Hansen, 6 North Michigan avenue, is engineer.

JEFFERSON, WIS.—St. Lawrence Distilling Co. has taken over the former Heger brewery and plan extensive improvements and alterations in putting the plant in shape to be used as a distillery. Considerable machinery and equipment will be installed.

KEWAUNEE, WIS.—Kewaunee Mfg. Co. has booked large contract for steel and frame laboratory equipment amounting to 35 carloads, for new $7,000,000 Mellon Institute of Industrial Research at Pittsburgh. Installation will be made next April.

MILWAUKEE—Blatz Brewing Co., 1120 North Broadway, plans alterations and equipment for beer canning. Cost will be $28,000 or more.

OSHKOSH, WIS.—City soon takes bids for waterworks, costing $130,000. Alvord, Burdick, & Howson, 20 North Wacker drive, Chicago, is engineer.

Minnesota

DULUTH—Coolerator Corp., W. F. Arndt president, manufacturer of air conditioned refrigerators, will step up production at its two plants, and additional machinery and equipment will be added.

FARIBAULT, MINN.—Faribault Canning Co. has started construction of a one-story warehouse and canning factory addition. Ralph W. Richardson, 922 New York building, St. Paul, is engineer.

JORDAN, MINN.—Schutz & Hilgers Jorden Brewery Inc. has started construction of a one and two-story bottling plant and warehouse to cost about $40,000. New bottling equipment, conveyors, and other machinery will be installed.

MILWAUKEE—Ladish Drop Forge Co., Cudahy, a suburb of Milwaukee, has let contracts for a plant addition to house tool and die department and steel stores.

MINNEAPOLIS — LaSalle Millwork Co. has ben incorporated with a capital stock of $50,000 to operate a new sash and door factory, by Ernest V. LaSalle, Samuel Paulson, and E. A. Paulson.

MINNEAPOLIS—V. A. Boker & Sons, 1920 Washington avenue, south, has been incorporated with a capital stock of $50,000 to manufacture tools of various types, by V. A., W. E., and J. P. Boker.

ST. PAUL—Gross Given Mfg. Co., 301 Chestnut street, St. Paul, has been incorporated for the purpose of manufacturing, marketing and selling metal products. The board of directors is composed of A. R. Gross, Harry S. Given, and Harvey O. Sergeant, attorney for the company, 1515 Pioneer building, St. Paul.

South Dakota

BERESFORD, S. DAK.—City secured $70,700 PWA grant and loan for proposed municipal electric plant and distribution lines. Plans go into effect soon.

Iowa

FAIRFIELD, IOWA—City council plans diesel electric light and power plant, costing $100,000. Federal Engineering Co., Davenport, Iowa, is engineer.

Nebraska

CAMBRIDGE, NEBR.—United power and irrigation district plans power and irrigation project including small power plant, costing $945,000. PWA application to be filed. C. Mickey, Lincoln, Nebr., is engineer.

FRIEND, NEBR.—City plans furnishing and installing diesel engine in power plant. Applied for $30,250 loan and $24,750 grant from PWA. H. A. Davis, Crete, Nebr., is engineer.

Wyoming

CASPER, WYO.—U. S. Government, bureau of reclamation, will take bids Nov. 26 for construction of the Seminole dam and power plant, which will involve the use of 2,550,000 pounds of reinforcing bars and fabric, 397,000 pounds of metal pipe, tubing and footings, 365,000 pounds of power penstock and outlet pipes, 1,535,000 pounds of needle valve and miscellaneous metal work, 1,002,000 pounds of gates and appurtenances, and 180,000 pounds of structural bridge steel. H. W. Bashore, Casper, Wyo., is resident government engineer.

Montana

LEWISTOWN, MONT.—City is considering installation of distributing system for natural gas service, including welded steel pipe line for supply service from fields at Armells, Mont. Cost is $230,000, and federal aid has been obtained.

Utah

PAROWAN, UTAH—City has begun expansion and improvement program in municipal power plant and waterworks system. $76,000 has been authorized. Caldwell & Richards, Templeton building, Salt Lake City, Utah, is consulting engineer.

Pacific Coast

EL CENTRO, CALIF.—Imperial irrigation district plans constructing 497 miles electrical distribution system in Imperial valley. Allocated $700,000 for project. M. J. Dowd, El Centro, is engineer.

LOS ANGELES—Appropriations of $85,000 have been voted by Los Angeles county board of supervisors, for immediate construction of five emergency debris basins above Altadena, Calif. Forces are under direction of C. H. Howell, chief engineer of county flood control district.

SOUTH GATE, CALIF.—General Motors Corp., General Motors building, Detroit, reports construction of the new $2,500,000 assembly plant is scheduled to begin Dec. 1, to be in operation April 1, 1936. The site selected by the company is between Alameda street and Tweedy boulevard.

ASHLAND, OREG.—Bids are called Dec. 2 for construction of a sewage disposal plant, involving 10,000 feet of concrete pipe.

CASCADE LOCKS, OREG.—City council will open bids Nov. 29 for construction of a water system, including concrete reservoir, intake lines, etc.

GRESHAM, OREG.—Bids for a sanitary storm sewer system and sewage disposal plant will be opened Dec. 4.

EMPIRE, OREG.—Bids are called Dec. 3 for improvements and extensions to the water system, involving purchase of a chlorinator.

TALENT, OREG.—Bids are called Dec. 2 for a sewage disposal plant.

TUALATIN, OREG.—Bids for a water system, including pressure tanks, turbine pumps, etc., will be received Dec. 2. H. L. Gilbert, Portland, Oreg., is designing engineer.

BELLEVUE, WASH. — Bellevue Water Co. will receive bids Nov. 29 for construction of two 100,000-gallon concrete tanks.

MT. VERNON, WASH.—Union district will receive bids Dec. 5 for increased school facilities including wood and metal working shops.

SEATTLE—Acme Ornamental Iron Works has acquired a building at 1321 Rainier avenue for increased plant capacity.

SEATTLE—University of Washington regents have called bids Dec. 11 for wind tunnel, aerodynamics building and mechanical equipment, costing $120,000.

Dominion of Canada

EAST WINDSOR, ONT.—Ford Motor Co. of Canada has invited bids for power house equipment to cost $2,000,000 in a plant modernization program. Project will provide more electric power and additional steam supply for processing and plant heating. Installations will include three turbo-generators and two boilers.

Foreign

PORTSMOUTH, ENGLAND—Municipality plans steam electric plant with distribution system, costing $1,000,000.